**R317. Environmental Quality, Water Quality.**
**R317-4. Onsite Wastewater Systems.**
**R317-4-1. Definitions.**

1.1. "Absorption bed" means an absorption system consisting of a covered, gravel-filled bed into which septic tank effluent is discharged through specially designed distribution pipes for seepage into the soil.

1.2. "Absorption system" means a device constructed to receive and to distribute effluent in such a manner that the effluent is effectively filtered and retained below ground surface.

1.3. "Absorption trench" means standard trenches, shallow trenches with capping fill, and chambered trenches constructed to receive and to distribute effluent in such a manner that the effluent is effectively filtered and retained below ground surface.

1.4. "Alternative onsite wastewater system" means a system for treatment and disposal of domestic wastewater or wastes which consists of a building sewer, a septic tank or other sewage treatment or storage unit, and a disposal facility or method which is not a conventional system; but not including a surface discharge to the waters of the state.

1.5. "At-Grade" System means an alternative type of onsite wastewater system where the bottom of the absorption system is placed at or below the elevation of the existing site grade, and the top of the distribution pipe is above the elevation of existing site grade, and the absorption system is contained within a fill body that extends above that grade.

1.6. "Bedrock" means the [~~solid~~] rock, usually solid, that underlies soil or other unconsolidated, superficial material [~~beneath the soil which is produced by the gradual weathering of bedrock, through physical and chemical processes leading to increasingly smaller and finer particles, loose sediments, or other unconsolidated material, and superficial rock~~].

1.7. "Bedroom" means any portion of a dwelling which is so designed as to furnish the minimum isolation necessary for use as a sleeping area. It may include, but is not limited to, a den, study, sewing room, sleeping loft, or enclosed porch. Unfinished basements shall be counted as a minimum of one additional bedroom.

1.8. "Building sewer" means the pipe which carries wastewater from the building drain to a public sewer, an onsite wastewater system or other point of disposal. It is synonymous with "house sewer".

1.9. "Chambered trench" means a type of absorption system where the media consists of an open bottom, chamber structure of an approved material and design, which may be used as a substitute for the gravel media with a perforated distribution pipe.

1.10. "Condominium" means the ownership of a single unit in a multi-unit project together with an undivided interest in common, in the common areas and facilities of the property.

1.11. "Conventional system" means an onsite wastewater system which consists of a building sewer, a septic tank, and an absorption system consisting of a standard trench, a shallow trench with capping fill, a chambered trench, a deep wall trench, a seepage pit, or an absorption bed.

1.12. "Curtain drain" means any ground water interceptor or drainage system that is gravel backfilled and is intended to interrupt or divert the course of shallow ground water or surface water away from the onsite wastewater system.

1.13. "Deep wall trench" means an absorption system consisting of deep trenches filled with clean, coarse filter material, with a minimum sidewall absorption depth of 24 inches of suitable soil formation below the distribution pipe, into which septic tank effluent is discharged for seepage into the soil.

1.14. "Division" means the Utah Division of Water Quality.

1.15. "Disposal area" means the entire area used for the subsurface treatment and dispersion of septic tank effluent by an absorption system.

1.16. "Distribution box" means a watertight structure which receives septic tank effluent and distributes it concurrently, in essentially equal portions, into two or more distribution pipes leading to an absorption system.

1.17. "Distribution pipe" means approved perforated pipe used in the dispersion of septic tank effluent into an absorption system.

1.18. "Domestic wastewater" means a combination of the liquid or water-carried wastes from residences, business buildings, institutions, and other establishments with installed plumbing facilities, together with those from industrial establishments, excluding non-domestic wastewater. It is synonymous with the term "sewage".

1.19. "Domestic septage" means the semi-liquid material that is pumped out of septic tanks receiving domestic wastewater. It consists of the sludge, the liquid, and the scum layer of the septic tank.

1.20. "Drainage system" means all the piping within public or private premises, which conveys sewage or other liquid wastes to a legal point of treatment and disposal, but does not include the mains of a public sewer system or a public sewage treatment or disposal plant.

1.21. "Drop box" means a watertight structure which receives septic tank effluent and distributes it into one or more distribution pipes, and into an overflow leading to another drop box and absorption system located at a lower elevation.

1.22. "Dwelling" means any structure, building, or any portion thereof which is used, intended, or designed to be occupied for human living purposes including, but not limited to, houses, mobile homes, hotels, motels, apartments, business, and industrial establishments.

1.23. "Earth fill" means an excavated or otherwise disturbed

suitable soil which is imported and placed over the native soil. It is characterized by having no distinct horizons or color patterns, as found in naturally developed undisturbed soils.

1.24. "Effluent lift pump" means a pump used to lift septic tank effluent to a disposal area at a higher elevation than the septic tank.

1.25. "Ejector pump" means a device to elevate or pump untreated sewage to a septic tank, public sewer, or other means of disposal.

1.26. "Experimental onsite wastewater system" means an onsite wastewater treatment and disposal system which is still in experimental use and requires further testing in order to provide sufficient information to determine its acceptance.

1.27. "Final local health department approval" means, for the purposes of the grandfather provisions in R317-4-2 (Table 1, footnote a) and R317-4-3, the approval given by a local health department which would allow construction and installation of subdivision improvements. Note: Even though final local health department approval may have been given for a subdivision, individual lot approval would still be required for issuance of a building permit on each lot.

1.28. "Ground water" means that portion of subsurface water that is in the zone of soil saturation.

1.29. "Ground water table" means the surface of a body of unconfined ground water in which the pressure is equal to that of the atmosphere.

1.30. "Ground water table, perched" means unconfined ground water separated from an underlying body of ground water by an unsaturated zone. Its water table is a perched water table. It is underlain by a restrictive strata or impervious layer. Perched ground water may be either permanent, where recharge is frequent enough to maintain a saturated zone above the perching bed, or temporary, where intermittent recharge is not great or frequent enough to prevent the perched water from disappearing from time to time as a result of drainage over the edge of or through the perching bed.

1.31. "Impervious strata" means a layer which prevents water or root penetration. In addition, it shall be defined as having a percolation rate greater than 60 minutes per inch.

1.32. "Invert" is the lowest portion of the internal cross section of a pipe or fitting.

1.33. "Liquid waste operation" means any business activity or solicitation by which liquid wastes are collected, transported, stored, or disposed of by a collection vehicle. This shall include, but not be limited to, the cleaning out of septic tanks, sewage holding tanks, chemical toilets, and vault privies.

1.34. "Liquid waste pumper" means any person who conducts a liquid waste operation business.

1.35. "Local health department" means a city-county or multi-county local health department established under Title 26A.

1.36. "Lot" means a portion of a subdivision, or any other parcel of land intended as a unit for transfer of ownership or for development or both and shall not include any part of the right-of-way of a street or road.

1.37. "Malfunctioning or failing system" means an onsite wastewater system which is not functioning in compliance with the requirements of this regulation and includes, but is not limited to, the following:

A. Absorption systems which seep or flow to the surface of the ground or into waters of the state.

B. Systems which have overflow from any of their components.

C. Systems which, due to failure to operate in accordance with their designed operation, cause backflow into any portion of a building plumbing system.

D. Systems discharging effluent which does not comply with applicable effluent discharge standards.

E. Leaking septic tanks.

1.38. "Maximum ground water table" means the highest elevation that the top of the "ground water table" or "ground water table, perched" is expected to reach for any reason over the full operating life of the onsite wastewater system at that site.

1.39. "Mound System" means an alternative onsite wastewater system where the bottom of the absorption system is placed above the elevation of the existing site grade, and the absorption system is contained in a mounded fill body above that grade.

1.40. "Non-domestic wastewater" means process wastewater originating from the manufacture of specific products. Such wastewater is usually more concentrated, more variable in content and rate, and requires more extensive or different treatment than domestic wastewater.

1.41. "Non-public water source" means a culinary water source that is not defined as a public water source.

1.42. "Onsite Wastewater System" means an underground wastewater disposal system for domestic wastewater which is designed for a capacity of 5,000 gallons per day or less, and is not designed to serve multiple dwelling units which are owned by separate owners except condominiums. It usually consists of a building sewer, a septic tank and an absorption system.

1.43. "Percolation rate" means the time expressed in minutes per inch required for water to seep into saturated soil at a constant rate during a percolation test.

1.44. "Percolation test" means the method used to measure the percolation rate of water into soil as described in these rules.

1.45. "Permeability" means the rate at which a soil transmits water when saturated.

1.46. "Person" means an individual, trust, firm, estate, company, corporation, partnership, association, state, state or federal agency or entity, municipality, commission, or political subdivision of a state (Section 19-1-103).

1.47. "Pollution" means any man-made or man-induced alteration of the chemical, physical, biological, or radiological integrity of any waters of the state, unless the alteration is necessary for public health and safety (Section 19-5-102).

1.48. "Public health hazard" means, for the purpose of this rule, a condition whereby there are sufficient types and amounts of biological, chemical, or physical agents relating to water or sewage which are likely to cause human illness, disorders or disability. These include, but are not limited to, pathogenic viruses and bacteria, parasites, toxic chemicals and radioactive isotopes. A malfunctioning onsite wastewater system constitutes a public health hazard.

1.49. "Public water source" means a culinary water source, either publicly or privately owned, providing water for human consumption and other domestic uses, as defined in R309.

1.50. "Regulatory Authority" means either the Utah Division of Water Quality or the local health department having jurisdiction.

1.51. "Replacement area" means sufficient land with suitable soil, excluding streets, roads, and permanent structures, which complies with the setback requirements of these rules, and is intended for the 100 percent replacement of absorption systems.

1.52. "Restrictive layer" means a layer in the soil that because of its structure or low permeability does not allow water entering from above to pass through as rapidly as it accumulates. During some part of every year, a restrictive layer is likely to have temporarily perched ground water table accumulated above it.

1.53. “Rotary tilling” means a tillage operation - working land by plowing, harrowing and manuring in order to make land ready for cultivation – employing power driven rotary motion of the tillage tool to loosen, shatter and mix soil.

[~~1.53~~]1.54. Scarification – loosening and breaking up of soil.

[~~1.54~~]1.55. "Scum" means a mass of sewage solids floating on the surface of wastes in a septic tank which is buoyed up by entrained gas, grease, or other substances.

[~~1.55~~]1.56. "Seepage pit" means an absorption system consisting of a covered pit into which septic tank effluent is discharged.

[~~1.56~~]1.57. "Septic tank" means a watertight receptacle which receives the discharge of a drainage system or part thereof, designed and constructed so as to retain solids, digest organic matter through a period of detention and allow the liquids to discharge into the soil outside of the tank through an absorption system meeting the requirements of these rules.

[~~1.57~~]1.58. "Septic tank effluent" means partially treated sewage which is discharged from a septic tank.

[~~1.58~~]1.59. "Sewage holding tank" means a watertight receptacle which receives water-carried wastes from the discharge of a drainage system and retains such wastes until removal and

subsequent disposal at an approved site or treatment facility.

[~~1.59~~]1.60. "Shall" means a mandatory requirement except when modified by action of the Department on the basis of justifying facts submitted as part of plans and specifications for a specific installation.

[~~1.60~~]1.61. "Shallow trenches with capping fill" means an absorption trench which meets all of the requirements of standard trenches except for the elevation of the installed trench. The minimum depth of installation is 10 inches from the natural existing grade to the trench bottom. The gravel and soil fill required above the pipe are placed as a "cap" to the trenches, installed above the natural existing grade.

[~~1.61~~]1.62. "Should" means recommended or preferred and is intended to mean a desirable standard.

[~~1.62~~]1.63. "Single-family dwelling" means a building designed to be used as a home by the owner or lessee of such building, and shall be the only dwelling located on a lot with the usual accessory buildings.

[~~1.63~~]1.64. "Sludge" means the accumulation of solids which have settled in a septic tank or a sewage holding tank.

[~~1.64~~]1.65. "Soil exploration pit" means an open pit dug to permit examination of the soil to evaluate its suitability for absorption systems.

[~~1.65~~]1.66. "Standard Trench" means an absorption system consisting of a series of covered, gravel-filled trenches into which septic tank effluent is discharged through specially designed distribution pipes for seepage into the soil.

[~~1.66~~]1.67. "Waste" or "Pollutant" means dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal, and agricultural waste discharged into water (Section 19-5-102).

[~~1.67~~]1.68. "Wastewater" means sewage, industrial waste or other liquid substances which might cause pollution of waters of the state. Intercepted ground water which is uncontaminated by wastes is not included.

[~~1.68~~]1.68. "Waters of the state" means all streams, lakes, ponds, marshes, watercourses, waterways, wells, springs, irrigation systems, drainage systems, and all other bodies or accumulations of water, surface and underground, natural or artificial, public or private, which are contained within, flow through, or border upon this state or any portion thereof, except that bodies of water confined to and retained within the limits of private property, and which do not develop into or constitute a nuisance, or a public health hazard, or a menace to fish and wildlife, are not "waters of the state" (Section 19-5-102).

**R317-4-2. Onsite Wastewater Systems Administrative Requirements.**

2.1. Scope. This rule shall apply to onsite wastewater

systems.

2.2. Nothing contained in this rule shall be construed to prevent the permitting local health department from:

A. adopting stricter requirements than those contained herein, but not limited to, for separation from physical features consistent with watershed, source water and ground water quality protection plans; or, requiring design modifications or additional technologies for nutrient management;

B. issuing a renewable operating permit at a frequency not exceeding five years with an inspection showing a satisfactory performance of the permitted system by the department's staff before renewal;

C. taking necessary steps for ground water quality protection through adoption of a ground water quality protection management policy based on a ground water management study, or a onsite systems management planning policy and land use planning through the county's agency;

D. prohibiting any alternative system within the department's jurisdiction;

E. assessing fees for administration of alternative systems

F. requiring the conventional and alternative system in its jurisdiction, be placed under an umbrella of:

1. a responsible management entity overseen by the local health department; or,

2. a contract service provider overseen by the local health department; or

3. a management district, body politic, created by the county for the purpose of operation, maintenance, repairs and monitoring of alternative or all onsite systems;

G. The local health department having jurisdiction must obtain approval from the Utah Water Quality Board to administer an alternative systems program, as outlined in this section, before permitting alternative systems.

H. The local health department request for approval must include:

1. A description of its plan to properly manage these systems to protect public health. This plan must include:

a. A description of review, inspection and monitoring procedures of these systems;

b. Resolutions of the Local Board of Health and the County Commission supporting this request

c. A description of the technical capability and training plans of the staff, and availability of resources to adequately manage the increased work load; and,

d. A statement from the county attorney of the county's legal authority to implement and enforce correction of malfunctioning systems and its commitment to exercise this authority.

I. An agreement to:

1. advise the owner of the system of the type of system,

and information concerning risk of failure, level of maintenance required, financial liability for repair, modification or replacement of a failed system and periodic monitoring requirements;

2. ensure the existence of the alternative system is recorded on the deed of ownership for that property;

3. provide oversight of installed systems;

4. inspect all installed systems at frequency specified in this rule, through:

a. the department's staff, or,

b. a contracted service provider, or,

c. a responsible management entity, or,

d. a management district body politic created by the county for the purpose of managing onsite systems:

e. maintain records of all installed systems, failures, modifications, repairs and all inspections recording the condition of the system at the time of inspection such as, but not limited to, overflow, surfacing, ponding and nuisance;

5. Submit an annual report on or before September 1 of the calendar year, to the Utah Water Quality Board showing:

a. A summary of a ground water quality protection management policy based on a ground water management study, or a onsite systems management planning policy and land use planning through the county's agency, including steps taken or planned to be taken for implementation of the policy.

b. type and number of systems approved, installed, modified, repaired, failed, inspected;

c. a summary of enforcement actions taken, pending and resolved;

d. a summary of performance of effluent quality showing concentrations of five-day total or carbonaceous biochemical oxygen demand, total suspended solids, nephelometric turbidity units, total nitrogen and Escherichia Coli of all installed systems except for at-grade, earth fill and mound systems;

e. a summary of the performance of contractors, responsible management entities, or management districts operating, maintaining and monitoring alternative systems; and,

f. management options followed in the reporting year and planned to be followed in the period after the reporting period.

J. Description of Management options to be followed:

1. Using the health department staff for all inspections and monitoring of permitted alternative systems; or,

2. Contracting with a responsible management entity employing qualified service providers for operating, maintaining and monitoring alternative systems, certified in accordance with R317-11; or,

3. Using a management district, body politic created by the county for the purpose of managing onsite systems with an annual performance review;, or,

4. An appropriate combination of contract providers or a

District, body politic.

K. All alternative systems will be inspected as follows:

1. All at-grade, earth fill and mound systems annually by

a. the local health department staff, or,

b. a contract service provider overseen by the local health department, or,

c. a responsible management entity overseen by the local health department, or,

d. a management district, body politic created by the county for the purpose of managing onsite systems.

2. All packed bed media systems at least twice a year by:

a. the local health department staff, or,

b. a contract service provider overseen by the local health department, or,

c. a responsible management entity overseen by the local health department, or,

d. a management district, body politic created by the county for the purpose of managing onsite systems.

2.3. Failure to Comply With Rules. Any person failing to comply with This rule will be subject to action as specified in Section 19-5-115 and 26A-1-123.

2.4. Onsite Wastewater System Required. The drainage system of each dwelling, building or premises covered herein shall receive all wastewater (including but not limited to bathroom, kitchen, and laundry wastes) and shall have a connection to a public sewer except when such sewer is not available or practicable for use, in which case connection shall be made as follows:

A. To an onsite wastewater system found to be adequate and constructed in accordance with requirements stated herein.

B. To any other type of wastewater system acceptable under R317-1, R317-3, R317-5, or R317-560.

2.5. Flows Prohibited From Entering Onsite Wastewater Systems. No ground water drainage, drainage from roofs, roads, yards, or other similar sources shall discharge into any portion of an onsite wastewater system, but shall be disposed of so they will in no way affect the system. Non domestic wastes such as chemicals, paints, or other substances which are detrimental to the proper functioning of an onsite wastewater system shall not be disposed of in such systems.

2.6. No Discharge to Surface Waters or Ground Surface. Effluent from any onsite wastewater system shall not be discharged to surface waters or upon the surface of the ground. Sewage shall not be discharged into any abandoned or unused well, or into any crevice, sinkhole, or similar opening, either natural or artificial.

2.7. Repair of a Failing or Unapproved System. Whenever an onsite wastewater system is found by the regulatory authority to create or contribute to any dangerous or insanitary condition which may involve a public health hazard, a malfunctioning system,

or deviates from the plans and specifications approved by such health authorities, the regulatory authority may order the owner to take the necessary action to cause the condition to be corrected, eliminated or otherwise come into compliance.

2.8. Procedure for Wastewater System Abandonment.

A. When a dwelling served by an onsite wastewater system is connected to a public sewer, the septic tank shall be abandoned and shall be disconnected from and bypassed with the building sewer unless otherwise approved by the regulatory authority.

B. Whenever the use of an onsite wastewater system has been abandoned or discontinued, the owner of the real property on which such wastewater system is located shall render it safe by having the septic tank wastes pumped out or otherwise disposed of in an approved manner, and the septic tank filled completely with earth, sand, or gravel within 30 days. The septic tank may also be removed within 30 days , at the owners discretion. The contents of a septic tank or other treatment device shall be disposed of only in a manner approved by the regulatory authority.

**R317-4-3. Onsite Wastewater Systems General Requirements.**

3.1. Units Required in an Onsite Wastewater System. The onsite wastewater system shall consist of the following components:

A. A building sewer.

B. A septic tank.

C. An absorption system. This may be a standard trench, a shallow trench with capping fill, a chambered trench, a deep wall trench, a seepage pit or pits, an absorption bed, or alternative or experimental systems as specified in this rule, depending on location, topography, soil conditions and ground water table.

3.2. Multiple Dwelling Units. Multiple dwelling units under individual ownership, except condominiums, shall not be served by a single onsite wastewater system except where that system is under the sponsorship of a body politic. Plans and specifications for such systems shall be submitted to and approved by the Utah Water Quality Board. Issuance of a construction permit by the Board shall constitute approval of plans and authorization for construction.

3.3. Review Criteria for Establishing Onsite Wastewater System Feasibility of Proposed Housing Subdivisions and Other Similar Developments. The local health department will review plans for proposed subdivisions and other similar developments for wastewater permit feasibility, prepared at the owner's expense by or under the supervision of a qualified person such as, a licensed environmental health scientist, or a registered civil, environmental or geotechnical engineer, certified by the regulatory authority. A plan of the subdivision shall be submitted to the local health department for review and shall be drawn to such scale as needed to show essential features. Ground surface contours must be included, preferably at two-foot

intervals unless smaller intervals are necessary to describe existing surface conditions. Intervals larger than two feet may be authorized on a case-by-case basis where it can be shown that they are adequate to describe all necessary terrain features. The plan must be specifically located with respect to the public land survey of Utah. A vicinity location map, preferably a U.S. Geological Survey 7-1/2 or 15 minute topographic map, shall be provided with the plan for ease in locating the subdivision area. A narrative feasibility report addressing the short-range and long-range water supply and wastewater system facilities proposed to serve the development must be submitted for review. The feasibility report shall include the following information:

A. Name and location of proposed development.

B. Name and address of the developer of the proposed project and the engineer or individual who submitted the feasibility report.

C. Statement of intended use of proposed development, such as residential-single family, multiple dwellings, commercial, industrial, or agricultural.

D. The proposed street and lot layout, the size and dimensions of each lot and the location of all water lines and easements, and if possible, the areas proposed for sewage disposal. All lots shall be consecutively numbered. The minimum required area of each lot shall be sufficient to permit the safe and effective use of an onsite wastewater system and shall include a replacement area for the absorption system. Plans used for multiple dwellings, commercial, and industrial purposes will require a study of anticipated sewage flows prior to developing suitable area requirements for sewage disposal.

E. Ground surface slope of areas proposed for onsite wastewater systems shall conform with the requirements of R317-4-4.

F. The location, type, and depth of all existing and proposed nonpublic water supply sources within 200 feet of onsite wastewater systems, and of all existing or proposed public water supply sources within 1500 feet of onsite wastewater systems.

G. The locations of all rivers, streams, creeks, washes (dry or ephemeral), lakes, canals, marshes, subsurface drains, natural storm water drains, lagoons, artificial impoundments, either existing or proposed, within or adjacent to the area to be planned , and cutting or filling of lots that will affect building sites. Areas proposed for onsite wastewater systems shall be isolated from pertinent ground features as specified in Table 2.

H. Surface drainage systems shall be included on the plan , as naturally occurring, and as altered by roadways or any drainage, grading or improvement, installed or proposed by the developer. The details of the surface drainage system shall show that the surface drainage structures, whether ditches, pipes, or culverts, will be adequate to handle all surface drainage so that it in no way will affect onsite wastewater systems on the

property. Details shall also be provided for the final disposal of surface runoff from the property.

I. If any part of a subdivision lies within or abuts a flood plain area, the flood plain shall be shown within a contour line and shall be clearly labeled on the plan with the words "flood plain area".

J. The location of all soil exploration pits and percolation test holes shall be clearly identified on the subdivision final plat and identified by a key number or letter designation. The results of such soil tests, including stratified depths of soils and final percolation rates for each lot shall be recorded on or with the final plat. All soil tests shall be conducted at the owner's expense.

K. A report by an engineer, geologist, or other person qualified by training and experience to prepare such reports must be submitted to show a comprehensive log of soil conditions for each lot proposed for an onsite wastewater system.

1. A sufficient number of soil exploration pits shall be dug on the property to provide an accurate description of subsurface soil conditions. Soil description shall conform with the United States Department of Agriculture soil classification system. Soil exploration pits shall be of sufficient size to permit visual inspection, and to a minimum depth of ten feet, and at least four feet below the bottom of proposed absorption systems. One end of each pit should be sloped gently to permit easy entry if necessary. Deeper soil exploration pits are required if deep absorption systems, such as deep wall trenches or seepage pits, are proposed.

2. For each soil exploration pit, a log of the subsurface formations encountered must be submitted for review which describes the texture, structure, and depth of each soil type, the depth of the ground water table if encountered, and any indications of the maximum ground water table.

3. Soil exploration pits and percolation tests shall be made at the rate of at least one test per lot. The local health department may allow fewer tests based on the uniformity of prevailing soil and ground water characteristics and available percolation test data. Percolation tests shall be conducted in accordance with R317-4-5. If soil conditions and surface topography indicate, a greater number of soil exploration pits or percolation tests may be required by the regulatory authority. Whenever available, information from published soil studies of the area of the proposed subdivision shall be submitted for review. Soil exploration pits and percolation tests must be conducted as closely as possible to the absorption system sites on the lots or parcels. The regulatory authority shall have the option of inspecting the open soil exploration pits and monitoring the percolation test procedure. Complete results shall be submitted for review, including all unacceptable test results. Absorption systems are not permitted in areas where the requirements of R317-

4-5 cannot be met or where the percolation rate is slower than 60 minutes per inch or faster than one minute per inch. Where soil and other site conditions are clearly unsuitable, there is no need for conducting soil exploration pits or percolation tests.

L. A statement by an engineer, geologist, or other person qualified by training and experience to prepare such statements, must be submitted indicating the present and maximum ground water table throughout the development. If there is evidence that the ground water table ever rises to less than two feet from the bottom of the proposed absorption systems , onsite wastewater absorption systems will not be approved. Ground water table determinations must be made in accordance with R317-4-5.

M. If ground surface slopes exceed four percent, or if soil conditions, drainage channels, ditches, ponds or watercourses are located in or near the project so as to complicate design and location of an onsite wastewater systems, a detailed system layout shall be provided for those lots presenting the greatest design difficulty. A typical lot layout will include, but not be limited to the following information, and shall be drawn to scale:

1. All critical dimensions and distances for the selected lot(s), including the distance of the onsite wastewater system from lakes, ponds, watercourses, etc.

2. Location of dwelling, with distances from street and property lines.

3. Location of water lines, water supply, onsite wastewater system, property lines, and lot easements.

4. Capacity of septic tank and dimensions and cross-section of absorption system.

5. Results and locations of individual soil exploration pits and percolation tests conducted on the selected lot(s).

6. If nonpublic wells or springs are to be provided, the plan shall show a typical lot layout indicating the relative location of the building, well or spring, and onsite wastewater system.

N. If proposed developments are located in aquifer recharge areas or areas of other particular geologic concern, the regulatory authority may require such additional information relative to ground water movement, or possible subsurface sewage flow.

O. Excessively Permeable Soil and Blow Sand. Soil having excessively high permeability, such as cobbles or gravels with little fines and large voids, affords little filtering action to effluents flowing through it and may constitute grounds for rejection of sites. The extremely fine-grained "blow sand" (aeolian sand) found in some parts of Utah is unsuitable for absorption systems, and onsite wastewater system for installation in such blow sand conditions shall not be approved. This shall not apply to lots which have received final local health department approval prior to the effective date of this rule.

1. Percolation test results in blow sand will generally be

rapid, but experience has shown that this soil has a tendency to become sealed with minute organic particles within a short period of time. For lots which are exempt as described above, systems may be constructed in such material provided it is found to be within the required range of percolation rates specified in these rules, and provided further that the required area shall be calculated on the assumption of the minimum acceptable percolation rate (60 minutes per inch for standard trenches, deep wall trenches, and seepage pits, and 30 minutes per inch for absorption beds).

2. Prohibition of Onsite Wastewater Systems. If soil studies described in the foregoing paragraphs indicate conditions which fail in any way to meet the requirements specified herein, the use of onsite wastewater systems in the area of study will be prohibited.

P. After review of all information, plans, and proposals, the regulatory authority will send a letter to the individual who submitted the feasibility report stating the results of the review or the need for additional information. An affirmative statement of feasibility does not imply that it will be possible to install onsite wastewater systems on all of the proposed lots, but shall mean that such onsite wastewater systems may be installed on the majority of the proposed lots in accordance with minimum State requirements and any conditions that may be imposed.

3.4. Submission, Review, and Approval of Plans for Onsite Wastewater Systems.

A. Plans and specifications for the construction, alteration, extension, or change of use of onsite wastewater systems which receive domestic wastewater, prepared at the owner's expense by or under the supervision of a qualified person such as, a licensed environmental health scientist, or a registered civil, environmental or geotechnical engineer, certified by the regulatory authority, shall be submitted to, and approved by the local health department having jurisdiction before construction of either the onsite wastewater system or building to be served by the onsite wastewater system may begin. Details for said site, plans, and specifications are listed in R317-4-4. After January 1, 2002, the design must be prepared in accordance with certification requirements in R317-11.

B. Plans and specifications for the construction, alteration, extension, or change of use of onsite wastewater systems which receive nondomestic wastewater shall be submitted to and approved by the Division of Water Quality.

C. The local health department having jurisdiction, or the Division, shall review said plans and specifications as to their adequacy of design for the intended purpose, and shall, if necessary, require such changes as are required by these rules. When the reviewing regulatory authority is satisfied that plans and specifications are adequate for the conditions under which a system is to be installed and used, written approval shall be

issued to the individual making the submittal and the plans shall be stamped indicating approval. Construction shall not commence until the plans have been approved by the regulatory authority. The installer shall not deviate from the approved design without the approval of the reviewing regulatory authority.

D. Depending on the individual site and circumstances, or as determined by the local board of health some or all of the following information may be required. Compliance with these rules must be determined by an on-site inspection after construction but before backfilling. Onsite wastewater systems must be constructed and installed in accordance with these rules.

E. In order that approval can be expedited, plans submitted for review must be drawn to scale (1" = 8', 16', etc. but not exceed 1" = 30'), or dimensions indicated. Plans must be prepared in such a manner that the contractor can read and follow them in order to install the system properly. Plan information that may be required is as follows:

1. Plot or property plan showing:

a. Date of application.

b. Direction of north.

c. Lot size and dimensions.

d. Legal description of property if available.

e. Ground surface contours (preferably at two-foot intervals) of both the original and final (proposed) grades of the property, or relative elevations using an established bench mark.

f. Location and dimensions of paved and unpaved driveways, roadways and parking areas.

g. Location and explanation of type of dwelling to be served by an onsite wastewater system.

h. Maximum number of bedrooms (including statement of whether a finished or unfinished basement will be provided), or if other than a single family dwelling, the number of occupants expected and the estimated gallons of wastewater generated per day.

i. Location and dimensions of the essential components of the onsite wastewater system.

j. Location of soil exploration pit(s) and percolation test holes.

k. Location of building sewer and water service line to serve dwelling.

l. The location, type, and depth of all existing and proposed nonpublic water supply sources within 200 feet of onsite wastewater systems, and of all existing or proposed public water supply sources within 1500 feet of onsite wastewater systems.

m. Distance to nearest public water main and size of main.

n. Distance to nearest public sewer, size of sewer, and whether accessible by gravity.

o. Location of easements or drainage right-of-ways affecting the property.

p. Location of all streams, ditches, watercourses, ponds,

subsurface drains, etc., (whether intermittent or year-round) within 100 feet of proposed onsite wastewater system.

2. Statement of soil conditions obtained from soil exploration pit(s) dug (preferably by backhoe) to a depth of ten feet in the absorption system area, or to the ground water table if it is shallower than 10 feet below ground surface. In the event that absorption system excavations will be deeper than six feet, soil exploration pits must extend to a depth of at least four feet below the bottom of the proposed absorption system excavation. One end of each pit should be sloped gently to permit easy entry if necessary. Whenever possible data from published soil studies of the site should also be submitted. Soil logs should be prepared in accordance with the United States Department of Agriculture soil classification system.

3. Statement with supporting evidence indicating (A) present and (B) maximum anticipated ground water table and (C) flooding potential for onsite wastewater system site.

4. The results of at least one stabilized percolation test for the design flow less than 2,000 gallons per day, or three tests if the design flow is more than 2,000 gallons per day, but less than 5,000 gallons per day, in the area of the proposed absorption system, conducted according to R317-4-5. Percolation tests should be conducted at a depth of six inches below the bottom of the proposed absorption system excavation and test results should be submitted on a "Percolation Test Certificate" obtainable upon request. If a deep wall trench or seepage pit is proposed, a completed "Deep Wall Trench Construction Certificate" may be submitted if percolation tests are not required.

5. Relative elevations (using an established bench mark) of the:

a. Building drain outlet.

b. The inlet and outlet inverts of the septic tank(s).

c. The outlet invert of the distribution box (if provided) and the ends or corners of each distribution pipe lateral in the absorption system.

d. The final ground surface over the absorption system.

e. Septic tank access cover, including length of extension, if used.

6. Schedule or grade, material, diameter, and minimum slope of building sewer.

7. Septic tank capacity, design (cross sections, etc.), materials, and dimensions. If tank is commercially manufactured, state name and address of manufacturer.

8. Details of drop boxes or distribution boxes (if provided)

9. Absorption system details which include the following:

a. Schedule or grade, material, and diameter of distribution pipes.

b. Required and proposed area for absorption system.

c. Length, slope, and spacing of each distribution pipeline.

d. Maximum slope across ground surface of absorption system

area.

e. Slope of distribution pipelines (maximum slope four inches/100 feet., level preferred)

f. Distance of distribution pipes from trees, cut banks, fills or other subsurface disposal systems.

g. Type and size of filter material to be used (must be clean, free from fines, etc.).

h. Cross section of absorption system showing:

i. Depth and width of absorption system excavation.

ii. Depth of distribution pipe.

iii. Depth of filter material.

iv. Barrier (i.e., synthetic filter fabric, straw, etc.) used to separate filter material from backfill.

v. Depth of backfill.

10. Schedule or grade, type, and capacity of sewage pump, pump well, discharge line, siphons, siphon chambers, etc., if required as part of the onsite wastewater system.

11. Statement indicating (A) source of water supply for dwelling (whether a well, spring, or public system) and (B) location and (C) distance from onsite wastewater disposal system. If plan approval of a nonpublic water supply system is desired, information regarding that system must be submitted separately.

12. Complete address of dwelling to be served by this onsite wastewater system. Also the name, current address, and telephone number of:

a. The person who will own the proposed onsite wastewater system.

b. The person who will construct and install the onsite wastewater system.

c. If mortgage loan for dwelling is insured or guaranteed by a federal agency, the name and local address of that agency.

F. All applicants requesting plan approval for an onsite wastewater system must submit a sufficient number of copies of the above required information to enable the regulatory authority to retain one copy as a permanent record.

G. Applications will be rejected if proper information is not submitted.

3.5. Final On-Site Inspection.

A. After an onsite wastewater system has been installed and before it is backfilled or used, the entire system shall be inspected by the appropriate regulatory authority to determine compliance with these rules. For deep wall trenches and seepage pits, the regulatory authority should make at least two inspections, with the first inspection being made following the excavation and the second inspection after the trench or pit has been filled with stone or constructed, but before any backfilling has occurred.

B. Each septic tank shall be tested for water tightness before backfilling in accordance with the requirements and procedure outlined in the American Society for Testing Materials'

Standard ASTM C-1227, or concrete tanks should be filled 24 hours before the inspection to allow stabilization of the water level. During the inspection there shall be no change in the water level for 30 minutes. Nor shall moving water, into or out of the tank , be visible. The regulatory authority may allow two piece tanks, with the joint below the water level, to be backfilled up to three inches below the joint to provide adequate support to the seam of the tank. Testing shall be supervised by the regulatory authority. Tanks exhibiting obvious defects or leaks shall not be approved unless such deficiencies are repaired to the satisfaction of the regulatory authority.

**R317-4-4. Onsite Wastewater Systems Design Requirements.**

4.1. Site Location and Installation.

A. Onsite wastewater systems are not suitable for all areas and situations. Location and installation of each system, or other approved means of disposal, shall be such that with reasonable maintenance, it will function in a sanitary manner and will not create a nuisance, public health hazard, or endanger the quality of any waters of the State. Systems shall be located on the same lot as the building served unless, when approved by the regulatory authority, a perpetual utility easement and right-of-way is established on an adjacent or nearby lot for the construction, operation, and continued maintenance, repair, alteration, inspection, relocation, and replacement of an onsite wastewater system, to include all rights to ingress and egress necessary or convenient for the full or complete use, occupation, and enjoyment of the granted easement. The easement must accommodate the entire onsite wastewater system, including setbacks (see Table 2) which extend beyond the property line.

B. In determining a suitable location for the system, due consideration shall be given to such factors as: size and shape of the lot; slope of natural and finished grade; location of existing and future water supplies; depth to ground water and bedrock; soil characteristics and depth; potential flooding or storm catchment; possible expansion of the system, and future connection to a public sewer system.

4.2. Lot Size Requirements.

A. One of the following two methods shall be used for determining minimum lot size for a single-family dwelling when an onsite wastewater system is to be used:

METHOD 1:-The local health department having jurisdiction may determine minimum lot size. Individuals or developers requesting lot size determinations under this method will be required to submit to the local health department, at their own expense, a report which accurately takes into account, but is not limited to, the following factors:

A. Soil type and depth.

B. Area drainage, lot drainage, and potential for flooding.

C. Protection of surface and ground waters.

D. Setbacks from property lines, water supplies, etc.
E. Source of culinary water.
F. Topography, geology, hydrology and ground cover.
G. Availability of public sewers.
H. Activity or land use, present and anticipated.
I. Growth patterns.
J. Individual and accumulated gross effects on water quality.
K. Reserve areas for additional subsurface disposal.
L. Anticipated sewage volume.
M. Climatic conditions.
N. Installation plans for wastewater system.
O. Area to be utilized by dwelling and other structures.

Under this method, local health departments may elect to involve other affected governmental entities and the Division in making joint lot size determinations. The Division will develop technical information, training programs, and provide engineering and geohydrologic assistance in making lot size determinations that will be available to local health departments upon their request.

METHOD 2:-Whenever local health departments do not establish minimum lot sizes for single-family dwellings that will be served by onsite wastewater systems, the requirements of Table 1 shall be met:

TABLE 1
Minimum Lot Size(a)

| WATER SUPPLY | SOIL TYPE 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Public(b) | 12,000 sq. ft. | 15,000 sq. ft. | 18,000 sq. ft. | 20,000 sq. ft. | -- |
| Individual each lot(c) | 1 acre | 1.25 acres | 1.5 acres | 1.75 acres | -- |

| SOIL TYPE | DRAINAGE | PERCOLATION RATE(d)(e) | APPROXIMATE SOIL CLASSIFICATION SYMBOL (USDA Soil Classification System)(e)(f) |
|---|---|---|---|
| 1 | Good | 1-15 | Sand, Loamy Sand |
| 2 | Fair | 16-30 | Sandy Loam, Loam |
| 3 | Poor | 30-45 | Loam, Silty Loam |
| 4 | Marginal | 46-60 | Sandy Clay Loam. Silty Clay Loam,(g). |
| 5 | Unacceptable (h) | | Clay Loam, Clay Bedrock, fractured bedrock, |

| | | |
|---|---|---|
| | | hardpan,<br>(including unacceptable ground water table elevations) |

FOOTNOTES

(a) Excluding public streets and alleys or other public rights-of-way, lands or any portion thereof abutting on, running through or within a building lot for a single-family dwelling. These minimum lot size requirements shall not apply to building lots which have been recorded or have received final local health department approval prior to May 21, 1984. Unrecorded lots which are part of subdivisions that have received final local health department approval prior to May 21, 1984 are only exempt from the minimum lot size requirements if the developer has and is proceeding with reasonable diligence. Notwithstanding this grandfather provision for recorded and other approved lots, the minimum lot size requirements are applicable if compelling or countervailing public health interests would necessitate application of these more stringent requirements. The shape of the lot must also be acceptable to the regulatory authority.

(b) This category shall also include lots served by a nonpublic water source that is not located on the lots.

(c) See the isolation requirements in Table 2.

(d) When deep wall trenches or seepage pits will be used, the percolation test may be estimated by a qualified person in accordance with R317-4-9.

(e) When there is a substantial discrepancy between the percolation rate and the approximate soil classification, it shall be resolved to the satisfaction of the regulatory authority, or the soil type requiring the largest lot shall be used.

(f) See Table 10 for a more detailed description of the USDA soil classification system.

(g) These soils are usually considered unsuitable for absorption systems, but may be suitable, depending upon the percentage and type of fines in coarse-grained porous soils, and the percentage of sand and gravels in fine-grained soils.

(h) Faster than one minute per inch, slower than 60 minutes per inch, or unsuitable soil formations.

B. Determination of minimum lot size by Methods 1 and 2 would not preempt local governments from establishing larger minimum lot sizes.

C. Available pertinent land for construction of other than single-family dwellings should have a minimum net available area in the amount of 22 square feet per gallon of estimated sewage computed from the fixture unit values established by Table 3 or other acceptable methods. Each fixture unit should be rated at not less than 25 gallons per day. One-half of this pertinent land area should be available for the absorption system.

4.3. Isolation of Onsite Wastewater Systems. Minimum

distances between components of an onsite wastewater disposal system and pertinent ground features shall be as prescribed in Table 2.

TABLE 2
Minimum Horizontal Distance in Feet(a)
(Undisturbed Earth)

| FROM | to Building Sewer | to Septic Tank |
|---|---|---|
| Public Water Supply Sources | | |
| Protected Aquifer Well (c) | 100 | 100 |
| Unprotected Aquifer Well (c) | (d) | (d) |
| Spring (c) | (d) | (d) |
| Individual or Nonpublic Water Supply Sources | | |
| Grouted Well (k) | 25 | 50 |
| Ungrouted Well (k) | 25 | 50 |
| Spring (c) | 25 | 50 |
| Non-culinary Well or Spring | -- | 25 |
| Watercourse (live or ephemeral stream, river, subsurface drain canal, etc.) | -- | 25 |
| Lake, Pond, Reservoir | -- | 25 |
| Culinary Water Supply Line | (g) | 10 |
| Foundation of any building including garages and outbuildings: | | |
| without foundation drains | 3 | 5 |
| with foundation drains | 3 | 25 |
| Curtain drains | | |
| located up gradient | -- | 10 |
| located down gradient | 10 | 25 |
| Property line | 5 | 5 |
| Swimming pool wall (subsurface) | 3 | 10 |
| Downslope cut bank or top of embankment | -- | 10 |
| Dry washes, gulches, and gullies | -- | 25 |

| | | |
|---|---|---|
| Catch basin or dry well | -- | 5 |
| Trees and shrubs (h) | -- | -- |
| Deep Wall Trench (b) | -- | 5 |
| Absorption Bed | -- | 5 |
| Standard/Chamber Trench | -- | 5 |

Minimum Horizontal Distance in Feet(a)
(Undisturbed Earth)

| FROM | to Standard Trench | to Deep Wall Trench | to Absorption Bed |
|---|---|---|---|
| Public Water Supply Sources | | | |
| Protected Aquifer Well (c) | 100 | 100 | 100 |
| Unprotected Aquifer Well (c) | (d) | (d) | (d) |
| Spring (c) | (d) | (d) | (d) |
| Individual or Nonpublic Water Supply Sources | | | |
| Grouted Well (k) | 100 | 100 | 100 |
| Ungrouted Well (k) | 200(e) | 200(e) | 200(e) |
| Spring (c) | 200(e) | 200(e) | 200(e) |
| Non-culinary Well or Spring | 100 | 100 | 100 |
| Watercourse (live or ephemeral stream, river, subsurface drain canal, etc.) | 100(f) | 100(f) | 100(f) |
| Lake, Pond, Reservoir | 100 | 100 | 100 |
| Culinary Water Supply Line | 10(g) | 10(g) | 10(g) |
| Foundation of any building including garages and outbuildings: | | | |
| without foundation drains | 5 | 20 | 5 |
| with foundation drains | 100 | 100 | 100 |
| Curtain drains | | | |
| located up gradient | 20 | 20 | 20 |
| located down gradient | 100 | 100 | 100 |
| Property line | 5 | 10 | 10 |

| | | | |
|---|---|---|---|
| Swimming pool wall (subsurface) | 25 | 25 | 25 |
| Downslope cut bank or top of embankment | 50 | 50 | 50 |
| Dry washes, gulches, and gullies | 50 | 50 | 50 |
| Catch basin or dry well | 25 | 25 | 25 |
| Trees and shrubs (h) | 5 | 5 | 5 |
| Deep Wall Trench (b) | 10 | (i) | 10 |
| Absorption Bed | 10 | 10 | 10 |
| Standard Trench | (j) | 10 | 10 |

FOOTNOTES

(a) All distances are from edge to edge. Where surface waters are involved, the distance shall be measured from the high water line.

(b) Seepage pits shall meet the same separation distances specified for deep wall trenches, except that seepage pits shall be separated from one another by at least a distance equal to 3 times the greatest diameter of either pit, with a minimum separation of 15 feet.

(c) As defined by R309-113-6. Distances to avoid contamination cannot always be predicted for varying conditions of soil or underlying bedrock and ground water. Absorption systems should be located as far away from wells, springs, and other water supplies as is practicable, and not on a direct slope above them. Compliance with separation requirements does not guarantee acceptable water quality in every instance. This is particularly applicable with shallow sources of ground water. Where geological or other conditions warrant, greater distances may be required by the regulatory authority.

(d) It is recommended that the listed concentrated sources of pollution be located at least 1500 feet or as required by the Drinking Water Source Protection rules, from unprotected aquifer wells and springs used as public water sources. Any proposal to locate closer than 1500 feet from the property line must be reviewed and approved by the regulatory authority, taking into account geology, hydrology, topography, existing land use agreements, consideration of the drinking water source protection requirements, protection of public health and potential for pollution of water source. Any person proposing to locate an onsite wastewater system closer than 1500 feet to a public unprotected aquifer well or spring must submit a report to the regulatory authority which considers the above items. The minimum

required isolation distance where optimum conditions exist and with the approval of the regulatory authority may be 100 feet. R309-113 requires a protective zone, established by the public water supply owner, before a new source is approved. Public water sources which existed prior to the requirement for a protective zone may not have acquired one. Such circumstances must be reviewed by the regulatory authority, taking into account geology, hydrology, topography, existing land use agreements, consideration of the drinking water source protection requirements, protection of public health and potential for pollution of water source.

(e) Although this distance shall be generally adhered to as the minimum required separation distance, exceptions may be approved by the regulatory authority, taking into account geology, hydrology, topography, existing land use agreements, consideration of the drinking water source protection requirements, protection of public health and potential for pollution of water source. Any person proposing to locate an absorption system closer than 200 feet to an individual or nonpublic ungrouted well or spring must submit a report to the regulatory authority which considers the above items. In no case shall the regulatory authority grant approval for an onsite wastewater system to be closer than 100 feet from an ungrouted well or a spring.

(f) Lining or enclosing watercourses with an acceptable impervious material may permit a reduction in the separation requirement. In situations where the bottom of a canal or watercourse is at a higher elevation than the ground in which the absorption system is to be installed, a reduction in the distance requirement may be justified, but each case must be decided on its own merits by the regulatory authority.

(g) If the water supply line is for a public water supply, the separation distance must comply with the requirements of R309. No water service line shall pass over any portion of an onsite wastewater system.

(h) Components which are not watertight should not extend into actual or anticipated root systems of nearby trees. Trees and other large rooted plants shall not be allowed to grow over onsite wastewater systems. However, it is desirable to cover the area over onsite wastewater systems with lawn grass or other shallow-rooted plants. Onsite wastewater systems should not be located under vegetable gardens.

(i) For deep wall trenches, the separation distance must be at least equal to 3 times the deepest effective depth of either trench with a minimum separation of 12 feet between trenches.

(j) See R317-4-9, Table 9.

(k) A grouted well is a well constructed as required in the drinking water rules R309.

4.4. Estimates of Wastewater Quantity. Quantity of wastewater to be disposed of shall be determined accurately, preferably by actual measurement. Metered water supply figures

for similar installations can usually be relied upon, providing the nondisposable consumption, if any, is subtracted. Where this data is not available, the minimum design flow figures in Table 3 shall be used to make estimates of flow. In no event shall the septic tank or absorption system be designed such that the anticipated maximum daily sewage flow exceeds the capacity for which the system was designed.

TABLE 3
Estimated Quantity of Domestic Wastewater(a)

| Type of Establishment | Gallons per day |
|---|---|
| Airports | |
| a. per passenger | 3 |
| b. per employee | 15 |
| Boarding Houses | |
| a. for each resident boarder and employee | 50 per person |
| b. additional for each nonresident boarders | 10 per person |
| Bowling Alleys | |
| a. with snack bar | 100 per alley |
| b. with no snack bar | 85 per alley |
| Camps | |
| a. modern camp | 30 per person |
| b. semi-developed with flush toilets | 30 per person |
| c. semi-developed with no flush toilets | 5 per person |
| Churches | |
| a. per person | 5 |
| Condominiums, Multiple Family Dwellings, or Apartments | |
| a. with individual or common laundry facilities | 400 per unit |
| b. with no individual or common laundry facilities | 75 per person |
| Country Clubs | |
| a. per resident member | 100 |
| b. per nonresident member present | 25 |
| c. per employee | 15 |
| Dentist's Office | |
| a. per chair | 200 |
| b. per staff member | 35 |
| Doctor's Office | |
| a. per patient | 10 |
| b. per staff member | 35 |
| Fairgrounds | 1 per person |
| Fire Stations | |
| a. with full-time employees and | |

| | | |
|---|---|---|
| food preparation | 70 | per person |
| b. with no full-time employees and no food preparation | 5 | per person |
| Gyms | | |
| a. participant | 25 | per person |
| b. spectator | 4 | per person |
| Hairdresser | | |
| a. per chair | 50 | |
| b. per operator | 35 | |
| Highway Rest Stops (improved, with restroom facilities) | 5 | per vehicle |
| Hospitals | 250 | per bed space |
| Hotels, Motels, and Resorts | 125 | per unit |
| Industrial Buildings (exclusive of industrial waste) | | |
| a. with showers, per 8 hour shift | 35 | per person |
| b. with no showers, per 8 hour shift | 15 | per person |
| Labor or Construction Camps | 50 | per person |
| Launderette | 580 | per washer |
| Mobile Home Parks | 400 | per unit |
| Movie Theaters | | |
| a. auditorium | 5 | per seat |
| b. drive-in | 10 | per car space |
| Nursing Homes | 200 | per bed space |
| Office Buildings and Business Establishments (Sanitary wastes only, per shift) | | |
| a. with cafeteria | 25 | per employee |
| b. with no cafeteria | 15 | per employee |
| Picnic Parks (toilet wastes only) | 5 | per person |
| Restaurants(b) | | |
| a. ordinary restaurants (not 24 hour service) | 35 | per seat |
| b. 24 hour service | 50 | per seat |
| c. single service customer utensils only | 2 | per customer |
| d. or, per customer served (includes toilet and kitchen wastes) | 10 | |
| Recreational Vehicle Parks | | |
| a. sanitary stations for self-contained vehicles | 50 | per space |
| b. dependent spaces (temporary or transient with no sewer connections) | 50 | per space |
| c. independent spaces (temporary or transient with sewer | | |

| | | |
|---|---|---|
| connections) | 125 | per space |
| Rooming House | 40 | per person |
| Sanitary Stations (per self-contained vehicle) | 50 | |
| Schools | | |
| a. boarding | 75 | per person |
| b. day, without cafeteria, gymnasiums or showers | 15 | per person |
| c. day, with cafeteria, but no gymnasiums and showers | 20 | per person |
| d. day, with cafeteria, gymnasium and showers | 25 | per person |
| Service Stations(c) (per vehicle served) | 10 | |
| Single-Family Dwellings | (See Tables 7, 10, and 13) | |
| Skating Rink, Dance Halls, etc. | | |
| a. no kitchen wastes | 10 | per person |
| b. additional for kitchen wastes | 3 | per person |
| Ski Areas | | |
| a. no kitchen wastes | 10 | per person |
| b. Additional for kitchen wastes | 3 | per person |
| Stores | | |
| a. per public toilet room | 500 | |
| b. per employee | 11 | |
| Swimming Pools and Bathhouses(d) | 10 | per person |
| Taverns, Bars, Cocktail Lounges | 20 | per seat |
| Visitor Centers | 5 | per visitor |

FOOTNOTES

(a) When more than one use will occur, the multiple use shall be considered in determining total flow. Small industrial plants maintaining a cafeteria or showers and club houses or motels maintaining swimming pools or laundries are typical examples of multiple uses. Uses other than those listed above shall be considered in relation to established flows from known or similar installations.

(b) No commercial food waste disposal unit shall be connected to an onsite wastewater system unless first approved by the regulatory authority.

(c) Or, 250 gallons per day per pump.

(d) Or, 20 x water area + deck area.

4.5. Installation in Sloping Ground.

A. Construction of absorption systems on slopes in excess of 15 percent but not greater than 25 percent may be allowed providing that subsoil profiles indicate no restrictive layers of soil and appropriate engineering design is provided. Absorption systems placed in sloping ground shall be so constructed that there is a minimum of 10 feet of undisturbed earth measured

horizontally from the bottom of the distribution line to the ground surface. Where the addition of fluids is judged to create an unstable slope, absorption systems will be prohibited.

B. Absorption systems shall be so located and constructed that there is a minimum of 50 feet from downhill slopes that exceed 35 percent.

C. Alternative systems shall be subject to the site slope limits specified in R317-4-11 for earth fill, "at-grade" systems and in mound systems.

4.6. Replacement Area for Absorption System. Adequate and suitable land shall be reserved and kept free of permanent structures, traffic, or adverse soil modification for 100 percent replacement of each absorption system. If approved by the regulatory authority, the area between standard trenches or deep wall trenches may be regarded as replacement area.

**R317-4-5. Soil and Ground Water Requirements.**

5.1. Soil Requirements.

A. In areas where onsite wastewater systems are to be constructed, soil cover must be adequate to insure at least 48 inches of suitable soil between bedrock formations or impervious strata and the bottom of the absorption system excavation. In cases where an approved fill is used, there shall be at least three feet of suitable soil from prevailing site grade to bedrock formations or impervious strata. For the purposes of this regulation, unsuitable soil or bedrock formations shall be deemed to be (1) soil or bedrock formations which are so slowly permeable that they prevent downward passage of effluent, or (2) soil or bedrock formations with open joints or solution channels which permit such rapid flow that effluent is not renovated. This includes coarse particles such as gravel, cobbles, or angular rock fragments with insufficient soil to fill the voids between the particles. Solid or fractured bedrock such as shale, sandstone, limestone, basalt, or granite are unacceptable for absorption systems. Where a mound system is used, there shall be at least two feet of suitable soil from prevailing site grade to formations which will permit such rapid flow that effluent will not be renovated.

B. A suitable soil for absorption systems shall meet the following criteria:

1. The distance between the maximum ground water table and the bottom of the absorption system excavation complies with the requirements of these rules.

2. Has the capacity to adequately disperse the designed effluent loading as determined by field percolation rates, or by other approved soil tests.

3. Does not exhibit inhibiting swelling or collapsing characteristics.

4. Does not visually exhibit a jointed or fractured pattern of an underlying bedrock.

5. Is not consolidated, cemented, indurated, or plugged by a buildup of secondary deposited calcium carbonate (caliche).

6. Acts as an effective effluent filter within its depth for the removal of pathogenic organisms.

7. Criteria for alternative onsite wastewater systems, as specified in R317-4-11 for earth fill systems, "at-grade" systems, and mound systems.

5.2. Ground Water Requirements.

A. In areas where absorption systems are to be constructed, the elevation of the anticipated maximum ground water table shall be at least 24 inches below the bottom of the absorption system excavation and at least 48 inches below finished grade. Local health departments and other local government entities may impose stricter separation requirements between absorption systems and the maximum ground water table when deemed necessary. Building lots recorded or having received final local health department approval prior to May 21,1984 shall be subject to the ground water table separation requirements of the then Part IV of the Code of Waste Disposal Regulations dated June 21, 1967. Unrecorded lots which are part of subdivisions that have received final local health department approval prior to May 21, 1984 are only exempt from the ground water table separation requirements of this regulation if the developer has and is proceeding with reasonable diligence. Notwithstanding this grandfather provision for recorded or other approved lots, the depth to ground water requirements are applicable if compelling or countervailing public health interests would necessitate application of the more stringent requirements of this regulation.

B. The maximum ground water table shall be determined by one or more of the following methods:

1. Direct visual observation of the maximum ground water table in a soil exploration pit.

2. Regular monitoring of the "ground water table" or "ground water table, perched" in an observation well for a period of one year, or for the period of maximum ground water table. Ground water monitoring shall be required where the anticipated maximum ground water table, including irrigation induced water table, might be expected to rise closer than 48 inches to the elevation of the bottom of the onsite wastewater system, or where alternative onsite wastewater systems may be considered.

3. Observation of soil in a soil exploration pit for evidence of crystals of salt left by the maximum ground water table; or chemically reduced iron in the soil, reflected by a mottled coloring.

C. If the highest elevation that the top of the ground water table or ground water table, perched, ever recorded, is expected to reach for any reason, including irrigation induced water table, over the full operating life of the conventional onsite wastewater system is within 24 inches of the bottom of the conventional onsite wastewater system the use of conventional onsite wastewater

systems in the area of study will be prohibited.

D. Previous ground water records and climatological or other information may be consulted for each site proposed for an onsite wastewater system and may be used to adjust the observed maximum ground water table elevation in determining the anticipated maximum ground water table elevation. In cases where the anticipated maximum ground water table is expected to rise to closer than 34 inches from the original ground surface and an alternative or experimental onsite wastewater system would be considered, previous ground water records and climatological or other information shall be used to adjust the observed maximum ground water table in determining the anticipated maximum ground water table.

E. A curtain drain or other effective ground water interceptor may be required to be installed for an absorption system as a condition for its approval. The health authority may require that the effectiveness of such devices in lowering the ground water table be demonstrated during the season of maximum ground water table.

5.3. Soil Exploration Requirements.

A. Suitable soil exploration pits, of sufficient size to permit visual inspection, and to a minimum depth of ten feet, or at least 48 inches below the bottom of proposed onsite wastewater systems, shall be dug on each absorption system site to determine the ground water table and subsurface soil and bedrock conditions. One end of each pit should be sloped gently to permit easy entry if necessary. A log of the soil and bedrock formations encountered must be submitted describing the texture, structure, and depth of each soil type, the depth of the ground water table encountered, and indications of the maximum elevation of the ground water table. Soil logs should be prepared in accordance with the United States Department of Agriculture Soil Classification System by qualified individuals. After January 1, 2002, the soil exploration and evaluation must be done in accordance with certification requirements in R317-11.

B. Proper safety precautions shall be taken whenever soil exploration pits or other excavations are dug for onsite wastewater systems.

5.4. Percolation Test Requirements. After January 1, 2002, percolation tests must be done in accordance with certification requirements in R317-11. At least one stabilized percolation test for the design flow less than 2,000 gallons per day, or three tests if the design flow is more than 2,000 gallons per day, but less than 5,000 gallons per day, shall be performed on the site of each absorption system to determine minimum required absorption area. More tests may be required where soil structure varies, where limiting geologic conditions are encountered, where the proposed property improvements will require large disposal systems, or where the health authority deems it necessary. Percolation tests shall be conducted in accordance with the

instructions in this section. Absorption systems are not permitted in areas where the soil percolation rate is slower than 60 minutes per inch or faster than one minute per inch.

A. When percolation tests are made, such tests shall be made at points and elevations selected as typical of the area in which the absorption system will be located. Consideration should be given to the finished grades of building sites so that test results will represent the percolation rate of the soil in which absorption systems will be constructed. After the suitability of any area to be used for onsite wastewater systems has been evaluated and approved for construction, no grade changes shall be made to this area unless the regulatory authority is notified and a reevaluation of the area's suitability is made prior to the initiation of construction.

B. Test results when required shall be considered an essential part of plans for absorption systems and shall be submitted on a signed "Percolation Test Certificate" or equivalent. Copies of the recommended Percolation Test Certificate form can be obtained from the Division of Water Quality. The test certificate must contain the following:

1. a signed statement certifying that the tests were conducted in accordance with this rule;

2. The name of the individual conducting the tests;

3. The location of the property

4. the depth and rate of each test in minutes per inch;

5. the date of the tests;

6. the logs of the soil exploration pits, including a statement of soil explorations to a depth of ten feet. In the event that absorption systems will be deeper than six feet, soil explorations must extend to a depth of at least four feet below the bottom of the proposed absorption system including, deep wall trench, seepage pit or absorption bed;

7. a statement of the present and anticipated maximum ground water table;

8. all other factors affecting percolation test results.

C. Percolation tests shall be conducted at the owner's expense by or under the supervision of a qualified person such as, a licensed environmental health scientist, or a registered civil, environmental or geotechnical engineer, certified by the regulatory authority, in accordance with the following:

1. Conditions Prohibited for Test Holes. Percolation tests shall not be conducted in test holes which extend into ground water, bedrock, or frozen ground. Where a fissured soil formation is encountered, tests shall be made under the direction of the regulatory authority.

2. Soil Exploration Pit Prerequisite to Percolation Tests. Since the appropriate percolation test depth depends on the soil conditions at a specific site, the percolation test should be conducted only after the soil exploration pit has been dug and examined for suitable and porous strata and ground water table

information. Percolation test results should be related to the soil conditions found.

3. Number and Location of Percolation Tests. One or more tests shall be made in separate test holes on the proposed absorption system site to assure that the results are representative of the soil conditions present. Percolation tests conducted for deep wall trenches and seepage pits shall comply with R317-4-9. Where questionable or poor soil conditions exist, the number of percolation tests and soil explorations necessary to yield accurate, representative information shall be determined by the regulatory authority and may be accepted only if conducted with an authorized representative present.

4. Test Holes to Commence in Specially Prepared Excavations. All percolation test holes should commence in specially prepared larger excavations (preferably made with a backhoe) of sufficient size which extend to a depth approximately six inches above the strata to be tested.

5. Type, Depth, and Dimensions of Test Holes. Test holes shall be dug or bored, preferably with hand tools such as shovels or augers, etc., and shall have horizontal dimensions ranging from four to 18 inches (preferably eight to twelve inches). The vertical sides shall be at least twelve inches deep, terminating in the soil at an elevation six inches below the bottom of the proposed onsite wastewater system. In testing individual soil strata for deep wall trenches and seepage pits, the percolation test hole shall be located entirely within the strata to be tested, if possible.

6. Preparation of Percolation Test Hole. Carefully roughen or scratch the bottom and sides of the hole with a knife blade or other sharp pointed instrument, in order to remove any smeared soil surfaces and to provide an open, natural soil interface into which water may percolate. Remove all loose soil from the bottom of the hole. Add two to three inches of clean coarse sand gravel to protect the bottom from scouring or sealing with sediment when water is added. Caving or sloughing in some test holes can be prevented by placing in the test hole a wire cylinder or perforated pipe surrounded by clean coarse gravel.

7. Saturation and Swelling of the Soil. It is important to distinguish between saturation and swelling. Saturation means that the void spaces between soil particles are full of water. This can be accomplished in a relatively short period of time. Swelling is a soil volume increase caused by intrusion of water into the individual soil particles. This is a slow process, especially in clay-type soil, and is the reason for requiring a prolonged swelling period.

8. Placing Water in Test Holes. Water should be placed carefully into the test holes by means of a small-diameter siphon hose or other suitable method to prevent washing down the side of the hole.

9. Percolation Rate Measurement, General. Necessary

equipment should consist of a tape measure (with at least 1/16-inch calibration) or float gauge and a time piece or other suitable equipment. All measurements shall be made from a fixed reference point near the top of the test hole to the surface of the water.

10. Test Procedure for Sandy or Granular Soils. For tests in sandy or granular soils containing little or no clay, the hole shall be carefully filled with clear water to a minimum depth of twelve inches over the gravel and the time for this amount of water to seep away shall be determined. The procedure shall be repeated and if the water from the second filling of the hole at least twelve inches above the gravel seeps away in ten minutes or less, the test may proceed immediately as follows:

a. Water shall be added to a point not more than six inches above the gravel.

b. Thereupon, from the fixed reference point, water levels shall be measured at ten minute intervals for a period of one hour.

c. If six inches of water seeps away in less than ten minutes a shorter time interval between measurements shall be used, but in no case shall the water depth exceed six inches.

d. The final water level drop shall be used to calculate the percolation rate.

11. Test Procedure for Other Soils Not Meeting the Above Requirements. The hole shall be carefully filled with clear water and a minimum depth of twelve inches shall be maintained above the gravel for at least a four hour period by refilling whenever necessary. Water remaining in the hole after four hours shall not be removed. Immediately following the saturation period, the soil shall be allowed to swell not less than 16 hours or more than 30 hours. Immediately following the soil swelling period, the percolation rate measurements shall be made as follows:

a. Any soil which has sloughed into the hole shall be removed and water shall be adjusted to six inches over the gravel.

b. Thereupon, from the fixed reference point, the water level shall be measured and recorded at approximately 30 minute intervals for a period of four hours unless two successive water level drops do not vary more than 1/16 of an inch and indicate that an approximate stabilized rate has been obtained.

c. The hole shall be filled with clear water to a point not more than six inches above the gravel whenever it becomes nearly empty.

d. Adjustments of the water level shall not be made during the last 3 measurement periods except to the limits of the last water level drop.

e. When the first six inches of water seeps away in less than 30 minutes, the time interval between measurements shall be ten minutes, and the test run for one hour.

f. The water depth shall not exceed six inches at any time during the measurement period.

g. The drop that occurs during the final measurement period shall be used in calculating the percolation rate.

12. Calculation of Percolation Rate. The percolation rate is equal to the time elapsed in minutes for the water column to drop, divided by the distance the water dropped in inches and fractions thereof.

13. Using Percolation Rate to Determine Absorption Area. The minimum or slowest percolation rate shall be used in calculating the required absorption area.

**R317-4-6. Building Sewer and Distribution Pipe.**

6.1. General Requirements. Pipe, pipe fittings, and similar materials comprising building sewers shall comply with the following:

A. They shall be composed of plastic, or other suitable material approved by the Division, and shall conform to the applicable standards as outlined in Tables in this section.

B. The following is a list of solid-wall pipe that has been approved for building sewers.

C. The pipe is listed by material and applicable standard. The Division may recognize other applicable standards.

TABLE 4

| MATERIALS | MINIMUM STANDARDS |
|---|---|
| A. Acrylonitrile-Butadiene | |
| Styrene (ABS) | (d) ASTM D-2680 |
| Schedule 40 | ASTM D-2751 (c) |
| | (pressure) |
| B. Polyvinyl Chloride (PVC) | |
| PVC-DWV Schedule 40 | ASTM D-2665 |
| PVC - Sewer | ASTM D-3033 |
| | ASTM D-3034 (pressure) |
| | ASTM F-789 |

D. The following is a list of solid-wall perforated pipe, approved as distribution pipe in absorption systems. Solid-wall pipe must be perforated in accordance with R317-4-6, and all burrs must be removed from the inside of the pipe. The pipe is listed by material and applicable standard. The Division may recognize other applicable standards.

TABLE 5

| MATERIALS | MINIMUM STANDARDS |
|---|---|
| A. Acrylonitrile-Butadiene | |
| Styrene (ABS) | ASTM D-2661 |
| Schedule 40 | ASTM D-2751 |

| | | |
|---|---|---|
| B. Polyethylene, Smooth | | |
| Wall (PE) | | ASTM D-1248 |
| | | ASTM D-3350 |
| C. Polyvinyl Chloride (PVC) | | (e) ASTM D-2729 |
| Schedule 40 | | ASTM D-2665 (pressure) |
| | | ASTM D-3033 |
| | | ASTM D-3034 (pressure) |

FOOTNOTES

(a) Each length of building sewer and absorption system pipe shall be stamped or marked as required by the International Plumbing Code.

(b) Building sewers include (1) the pipe installed between the building and the septic tank and (2) between the septic tank and the distribution box (or absorption system). The installation of building sewers shall comply with the International Plumbing Code.

(c) American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania 19103.

(d) For domestic sewage only, free from industrial wastes.

(e) Although perforated PVC, ASTM D-2729 is approved for absorption system application, the solid-wall version of this pipe is not approved for building sewer application.

E. Where two different sizes or types of sewer pipes are connected, a proper type of fitting or conversion adapter shall be used.

F. They shall have a minimum inside diameter of four inches. They shall have watertight, root-proof joints and shall not receive any ground water or surface runoff. They shall be laid in straight alignment and on a firm foundation of undisturbed earth or acceptably stabilized earth that is not subject to settling.

G. Building sewers shall be laid on a uniform minimum slope of not less than 1/4-inch per foot (2.08 percent slope). When it is impractical, due to structural features or the arrangement of any building, to obtain a slope of 1/4-inch per foot, a building sewer of four inches in diameter or larger may have a slope of not less than 1/8-inch per foot (1.04 percent slope) when approved by the regulatory authority.

H. The lines shall have cleanouts every 100 feet and at all changes in direction or grade, except where manholes are installed every 400 feet and at every change in direction or grade. On four-inch and six-inch lines, two 45 degree bends with cleanout will be acceptable in lieu of a manhole, and 90 degree ells are not recommended.

I. Building sewers shall be separated from water service pipes in separate trenches and by at least ten feet horizontally except that they may be placed in the same trench when the following three conditions are met:

1. The bottom of the water service pipe, at all points,

shall be at least 18 inches above the top of the building sewer.

2. The water service pipe shall be placed on a solid shelf excavated at one side of the common trench.

3. The number of joints in the service pipe shall be kept to a minimum, and the materials and joints of both the sewer and water service pipe shall be of a strength and durability to prevent leakage under adverse conditions.

J. If the water service pipe must cross the building sewer, it shall be at least 18 inches above the latter within ten feet of the crossing. Joints in water service pipes should be located at least ten feet from such crossings.

6.2. Ejector Pumps, Effluent Lift Pumps, and Pump Wells.

A. Ejector pumps discharging into septic tanks shall comply with the International Plumbing Code.

B. When septic tank effluent lift pumps and pump wells are part of an onsite wastewater disposal system, they shall comply with the following:

1. Pumps shall be so placed as to be self-priming, and should operate under positive suction head at all times. A quick disconnect for pumps, such as a union, should be provided between the pump and the line leading to the absorption system. Pumps shall be adequately housed to protect the pump motors from bad weather and protection shall be given to prevent freezing in any portion of the unit. Except for single-family dwellings, pumps shall be installed in duplicate with either pump having adequate capacity to handle maximum flow.

2. Minimum capacity shall be 10 gallons per minute at the necessary discharge head. Pumps shall be capable of passing a 3/4-inch solid sphere and shall have a minimum 2-inch discharge. Suitable shutoff valves shall be placed on suction and discharge lines of each pump and a check valve shall be placed on each discharge line between the shutoff valve and the pump.

3. The pressure line shall be constructed of piping material of a bursting pressure of at least 100 psi and shall be of approved corrosion-resistant material. The pressure line shall be bedded in 3 inches of sand or pea gravel. Pumps may be oil filled submersible pumps or vertically-mounted column pumps. Impellers shall be of cast iron, bronze or other corrosion-resistant material. Level control shall be by a float switch or by other acceptable methods. The pump well shall be constructed of corrosion-resistant material of sufficient strength to withstand the soil pressures related to the depth of the sump, and shall be adequately protected against surface flooding. Capacity of the pump well shall not be less than 50 gallons, and shall be sized to provide between 3 and six pumping cycles per day. Pump wells shall have adequate ventilation and shall be provided with a maintenance access manhole at the ground surface or above and of at least 24-inch diameter with a durable locking-type cover.

4. Power supply should be available from at least 2 independent generating sources, or emergency power equipment

should be provided. Where power failure may result in objectionable conditions or unauthorized waste discharge, means for emergency operation shall be provided.

5. Electrical systems and components (i.e. motors, lights, cables, conduits, switch boxes, control circuits, etc.) in sewage pump wells, or in enclosed or partially enclosed spaces where hazardous concentrations of flammable gases or vapors may be present, shall comply with the National Electrical Code requirements for Class I, Group D, Division I locations. In addition, equipment located in the pump well shall be suitable for use under corrosive conditions. Each flexible cable shall be provided with a watertight seal and separate strain relief. A fused disconnect switch located above ground shall be provided in all pumping stations.

**R317-4-7. Septic Tanks.**

7.1. General Requirements.

A. Septic tanks shall be constructed of sound, durable, watertight materials that are not subject to excessive corrosion, frost damage, or decay. They shall be designed to be watertight, and to withstand all expected physical forces, to provide settling of solids, accumulation of sludge and scum, and be accessible for inspection and cleaning as specified in the following paragraphs:

B. Illustrations of typical absorption system components such as septic tanks, distribution boxes, and absorption systems are contained in an addendum to these rules, available through the Division of Water Quality.

7.2. Overall Construction and Design Features.

A. Septic tanks may be constructed of the following:

1. Precast reinforced concrete
2. Fiberglass
3. Polyethylene
4. Poured-in-place concrete
5. Material approved by the Division

B. Septic tanks may have single or multiple compartments and may be oval, circular, rectangular, or square in plan, provided the distance between the inlet and outlet of the tank is at least equal to the liquid depth of the tank. In general, the tank length should be at least two to three times the tank width.

C. All septic tanks may have an effluent filter installed at the outlet of the tank. The filter shall prevent the passage of solid particles larger than a nominal 1/8 inch diameter sphere. The filter should be easily removed for routine servicing through watertight access from the ground surface, or be bypassed with a piping arrangement.

7.3. Plans for Tanks Required.

A. Plans for all septic tanks shall be submitted to the regulatory authority for approval. Such plans shall show all dimensions, capacities, reinforcing, and such other pertinent data as may be required. All septic tanks shall conform to the design

drawings and all building shall be done under strict controlled supervision by the manufacturer.

B. Commercial septic tank manufacturers shall submit design plans for each tank model manufactured to the Division for review and approval. The manufacturer shall certify in writing to the Division that the septic tanks to be distributed for use in the State of Utah will comply with this regulation. It is recommended that such plans also be evaluated by a registered engineer as to surcharge, impact load, and deadload. Any changes in the design of commercially manufactured septic tanks shall be submitted to the Division for approval.

7.4. Tank Capacity for Single-Family Dwellings. The minimum liquid capacity of septic tanks serving single-family dwellings shall be based on the number of bedrooms in each dwelling, in accordance with Table 6.

TABLE 6
Minimum Capacities for Septic Tanks(a)

| Number of Bedrooms(b) | Minimum Liquid Capacity(c)(d) (Gallons) |
|---|---|
| 1 | 750 |
| 2 or 3 | 1000 |
| 4 | 1250 |
| For each additional bedroom, add | 250 |

FOOTNOTES

(a) Tanks larger than the minimum required capacity are generally more economical since they do not have to be cleaned as often.

(b) Based on the number of bedrooms in use or that can be reasonably anticipated in the dwelling served, including the unfinished space available for conversion as additional bedrooms. Unfinished basements shall be counted as a minimum of one additional bedroom.

(c) The liquid capacity is calculated on the depth from the invert of the outlet pipe to the inside bottom of the tank. A variance of three percent in the required volume may be allowed.

(d) Table 6 provides for the normal household appliances, including automatic sequence washers, mechanical garbage grinders, and dishwashers.

7.5. Tank Capacity for Commercial, Institutional, and Recreational Facilities, and Multiple Dwellings.

A. The minimum liquid capacity of septic tanks serving commercial, institutional, and recreational facilities, and multiple dwellings shall be determined on the following basis:

1. For wastewater flows up to 500 gallons per day, the liquid capacity of the tank shall be at least 750 gallons.

2. For wastewater flows between 500 and 1,500 gallons per day, the liquid capacity of the tank shall be at least 1.5 times the 24-hour estimated sewage flow (see Table 3).

3. For wastewater flows between 1,500 and 5,000 gallons per day, the liquid capacity of the tank shall equal at least 1,125 gallons plus 75 percent of the daily wastewater flow (V = 1,125 + 0.75Q where V = liquid volume of the tank in gallons, and Q = wastewater discharge in gallons per day).

B. In cases where dwellings or facilities are subject to high peak sewage flows, the liquid capacity of the onsite wastewater system shall be increased as required by the regulatory authority.

7.6. Precast Reinforced Concrete Septic Tanks.

A. The walls and base of precast tanks shall be securely bonded together and the walls shall be of monolithic or keyed construction. The sidewalls and bottom of such tanks shall be at least 3 inches in thickness. The top shall have a minimum thickness of four inches. Such tanks shall have reinforcing of at least six inch x six inch No. 6, welded wire fabric, or equivalent. Exceptions to this reinforcing requirement may be considered by the Division based on an evaluation of acceptable structural engineering data submitted by the manufacturer. All concrete used in precast tanks shall be Class A, at least 4,000 pounds per square inch, and shall be vibrated or well-rodded to minimize honeycombing and to assure reasonable watertightness. Precast sections shall be set evenly in a full bed of sealant. If grout is used it shall consist of two parts plaster sand to one part cement with sufficient water added to make the grout flow under its own weight. Excessively mortared joints should be trimmed flush. The inside and outside of each mortar joint shall be sealed with a waterproof bituminous sealing compound.

B. For the purpose of early reuse of forms, the concrete may be steam cured. Other curing by means of water spraying or a membrane curing compound may be used and shall comply to best acceptable methods as outlined in "Curing Concrete, ACI308-71," by American Concrete Institute, P.O. Box 19150, Detroit, Michigan 84219.

7.7. Fiberglass Septic Tanks.

A. Fiberglass septic tanks shall comply with the criteria for acceptance established in the "Interim Guide Criteria For Glass-Fiber-Reinforced Polyester Septic Tanks", International Association of Plumbing and Mechanical Officials, 5032 Alhambra Avenue, Los Angeles, California 90032. The identifying seal of the International Association of Plumbing and Mechanical Officials must be permanently embossed in the fiberglass as evidence of compliance. The design requirements in R317-4-7 shall also be met. Other required identity marks must also comply with this rule.

B. Inlet and outlet tees shall be attached to the tank by a rubber or synthetic rubber ring seal and compression plate, or in some other manner approved by the Division.

C. The tank shall be installed in accordance with the manufacturer's recommendations. If no such recommendations are provided, the following installation procedures shall apply:

1. During installation, careful handling of the tank is necessary to prevent damage. Tanks shall not be installed under areas subject to vehicular traffic or heavy equipment.

2. There shall be a minimum of twelve inches of approved, compacted backfill material under the tank as a resting bed. The resting bed must be smooth and level.

3. The hole that the tank is to be installed in shall be large enough to allow a minimum of twelve inches from the ends and sides of the tank to the hole wall.

4. Approved backfill material shall be a naturally-rounded aggregate, clean and free flowing, with a particle size of 3/8-inch or less in diameter. Crushed stone or gravel of the same particle size may be used if naturally-rounded aggregate is not available, but should be washed and free flowing.

5. Backfilling shall be accomplished to the top of the tank in twelve -inch lifts with each layer being well compacted. Sharp tools should not be used near the septic tank. With the manhole cover(s) in place, water should be added to the tank during backfilling. The water level in the tank should coincide approximately with the backfill depth. With the tank full of water, the excavation should be brought to grade with the same approved backfill materials. Depth of backfill over the top of the tank shall not exceed 2-1/2 feet.

7.8. Polyethylene Septic Tanks.

A. Polyethylene septic tanks shall comply with the criteria for acceptance established in "Prefabricated Septic Tanks and Sewage Holding Tanks, Can3-B66-M79" by the Canadian Standards Association, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W1R3. Required identifying marks shall comply with this rule.

B. Inlet and outlet tees shall be attached to the tank by a rubber or synthetic rubber ring seal and compression plate, or in some other manner approved by the Division.

C. The tank shall be installed in accordance with the manufacturer's recommendations. If no such recommendations are provided, the installation procedures in R317-4-7 shall apply.

7.9. Poured-In-Place Concrete Septic Tanks. The top of poured-in-place septic tanks with a liquid capacity of 750 to 1,250 gallons shall be a minimum of four inches thick, and reinforced with one 3/8-inch reinforcing rod per foot of length, or equivalent. The top of tanks with a liquid capacity of greater than 1,250 gallons up to the maximum design capacity shall be a minimum of six inches thick, and reinforced with 3/8-inch reinforcing rods eight inches on centers both ways, or equivalent. The walls and floor shall be a minimum of six inches thick. The

walls shall be reinforced with 3/8-inch reinforcing rods eight inches on centers both ways, or equivalent. Inspections by the regulatory authority may be required of the tank reinforcing steel before any concrete is poured. A six-inch water stop shall be used at the wall-floor juncture to insure watertightness. All concrete used in poured-in-place tanks shall be Class A, at least 4,000 pounds per square inch, and shall be vibrated or well-rodded to minimize honeycombing and to insure watertightness. Curing of concrete shall comply with the requirements in R317-4-7.

7.10. Identifying Marks. All prefabricated or precast septic tanks which are commercially manufactured shall be plainly, legibly, and permanently marked or stamped on the exterior at the outlet end and within six inches of the top of the wall, with the name and address or nationally registered trademark of the manufacturer and the liquid capacity of the tank in gallons. Both the inlet and outlet of all such tanks shall be plainly marked as IN or OUT, respectively.

7.11. Liquid Depth of Tanks. Liquid depth of septic tanks shall be at least 30 inches. Depth in excess of 72 inches shall not be considered in calculating liquid volume required in R317-4-7.

7.12. Tank Compartments. Septic tanks may be divided into compartments provided each meets applicable requirements stated herein as well as the following:

A. The volume of the first compartment must equal or exceed two thirds of the total required septic tank volume.

B. No compartment shall have an inside horizontal distance less than 24 inches.

C. Inlets and outlets shall be designed as specified for tanks, except that when a partition wall is used to form a multi-compartment tank, an opening in the partition may serve for flow between compartments provided the minimum dimension of the opening is four inches, the cross-sectional area is not less than that of a six -inch diameter pipe (28.3 square inches), and the mid-point is below the liquid surface a distance approximately equal to 40 percent of the liquid depth of the tank.

D. No tank shall have an excess of three compartments.

7.13. Tanks in Series. Additional septic tank capacity over 750 gallons may be obtained by joining uncompartmented tanks in series to obtain the required capacity providing the following are complied with:

A. No tank in the series shall be smaller than 750 gallons.

B. The capacity of the first tank shall be at least two thirds of the required total septic tank volume.

C. The outlet of each successive tank shall be at least 2 inches lower than the outlet of the preceding tank, and shall be unrestricted except for the inlet to the first tank and the outlet for the last tank.

D. The number of tanks in series shall not exceed three.

7.14. Inlets and Outlets. Inlets and outlets of tanks or

compartments thereof shall meet the material and minimum diameter requirements for building sewers and shall be tee-ed or baffled with the object of diverting incoming flow toward the tank bottom and minimizing as much as possible the discharge of sludge or scum in the effluent. Inlet or outlet devices shall also conform with the following:

A. Inlets and outlets should be located on opposite ends of the tank. The invert of flow line of the inlet shall be located at least two inches (and preferably three inches) above the invert of the outlet to allow for momentary rise in liquid level during discharge to the tank.

B. An inlet baffle or sanitary tee of wide sweep design shall be provided to divert the incoming sewage downward. This baffle or tee is to penetrate at least six inches below the liquid level, but the penetration is not to be greater than that allowed for the outlet device.

C. For tanks with vertical sides, outlet baffles or sanitary tees shall extend below the liquid surface a distance equal to approximately 40 percent of the liquid depth. For horizontal cylindrical tanks and tanks of other shapes, that distance shall be reduced to approximately 35 percent of the liquid depth.

D. All baffles shall be constructed from sidewall to sidewall or shall be designed as a conduit.

E. All inlet and outlet devices shall be permanently fastened in a vertical, rigid position. Inlet and outlet pipe connections to the septic tank shall be sealed with a bonding compound that will adhere to the tank and pipes to form watertight connections, or watertight sealing rings.

F. Inlet and outlet devices shall not include any design features preventing free venting of gases generated in the tank or absorption system back through the roof vent in the building plumbing system. The top of the baffles or sanitary tees must extend at least six inches above the liquid level in order to provide scum storage, but no closer than one inch to the inside top of the tank.

G. Offset inlets may be approved by the regulatory authority where they are warranted by constraints on septic tank location.

H. Multiple outlets from septic tanks shall be prohibited.

I. A gas deflector may be added at the outlet of the tank to prevent solids from entering the outlet pipe of the tank.

7.15. Scum Storage. Scum storage volume shall consist of 15 percent or more of the required liquid capacity of the tank and shall be provided in the space between the liquid surface and the top of inlet and outlet devices.

7.16. Accessibility of Tank. Septic tanks shall be installed in a location so as to be accessible for servicing and cleaning, and shall have no structure or other obstruction placed over them so as to interfere with such operations. Tanks should be placed between the dwelling and the street whenever possible to facilitate connection to the sanitary sewer at the time such a

sewer is installed.

7.17. Access to Tank Interior. Adequate access to the tank shall be provided to facilitate inspection and cleaning and shall conform to the following requirements:

A. Access to each compartment of the tank shall be provided through properly placed manhole openings not less than 18 inches, preferably 22 inches, in minimum horizontal dimension or by means of an easily removable lid section.

B. Access to inlet and outlet devices shall be provided through properly spaced openings not less than twelve (12) inches in minimum horizontal dimension or by means of an easily removable lid section.

C. The top of the tank shall be at least six inches below finished grade.

D. All manholes required by R317-4-7. shall be extended to within at least four inches of the finished grade. The manhole extensions shall be constructed of durable, structurally sound materials which are approved by the regulatory authority and designed to withstand expected physical loads and corrosive forces.

E. Access covers for manhole openings shall have adequate handles and shall be designed and constructed in such a manner that they cannot pass through the access openings, and when closed will be child-proof and prevent entrance of surface water, dirt, or other foreign material, and seal the odorous gases in the tank.

F. No septic tank shall be located under paving unless extensions to the access openings are extended up through the paving and the manholes are equipped with a locking-type cover.

7.18. Tank Cover. Septic tank covers shall be sufficiently strong to support whatever load may reasonably be expected to be imposed upon them and tight enough to prevent the entrance of surface water, dirt, or other foreign matter, and seal the odorous gases of digestion.

7.19. Tank Excavation and Backfill. The hole to receive the tank shall be large enough to permit the proper placement of the tank and backfill. Tanks shall be installed on a solid base that will not settle and shall be level. Where rock or other undesirable protruding obstructions are encountered, the bottom of the hole should be excavated an additional six inches and backfilled with sand, crushed stone, or gravel to the proper grade. Backfill around and over the septic tank shall be placed in such a manner as to prevent undue strain or damage to the tank or connected pipes.

7.20. Installation in Ground Water. If septic tanks are installed in ground water, the regulatory authority may require adequate ground anchoring devices to be installed to prevent the tank from floating when it is emptied during cleaning operations.

7.21. Maintenance Requirements. Maintenance Requirements - Adequate maintenance shall be provided for septic tanks to insure their proper function. Recommendations for the inspection and

cleaning of septic tanks are provided in R317-4-13.

**R317-4-8. Discharge to Absorption Systems.**

8.1. General Requirements. Septic tank effluent shall be conducted to the absorption system through a watertight pipe and fittings which meet the material, diameter, and slope requirements for building sewers. Tees, wyes, ells, or other distributing devices may be used as needed. Illustrations of typical components such as septic tanks, distribution boxes, and absorption systems are contained in an addendum to these rules, available through the Division of Water Quality

8.2. Tees and Wyes. Tees and wyes shall be installed level to permit equal flow to the branches of the fitting.

8.3. Drop Boxes. On level or sloping topography, drop boxes may be used to distribute effluent within the absorption system. They are usually installed in the middle or at the head end of each trench. They shall be watertight and constructed of concrete or other durable material approved by the Division. They shall be designed to accommodate the inlet pipe, an outlet pipe leading to the next drop box (except for the last drop box), and 1 or 2 distribution pipes leading to the absorption system. Drop boxes shall meet the following requirements:

A. The inlet pipe to the drop box shall be at least one inch higher than the outlet pipe leading to the next drop box.

B. The invert of the distribution pipes(s) shall be four to six inches below the outlet invert. If there is more than one distribution pipe, their inverts shall be at exactly the same elevation. Drop boxes shall be installed level and the flow from multiple distribution lines should be checked by filling the drop box with water up to the outlets.

C. The inlet and outlet of the drop box shall be sealed watertight to the sidewalls of the drop box.

D. The drop box shall be provided with a means of access. The top of the drop box shall have a lid of compatible construction and material as the drop box, and be adequate to prevent entrance of water, dirt or other foreign material, but made removable for observation and maintenance of the system. The top of the drop box shall be at least six inches below finished grade.

E. The drop box must be installed on a level, solid foundation to insure against tilting or settling. To minimize frost action and reduce the possibility of movement once installed, drop boxes should be set on a bed of sand or pea gravel at least 12 inches thick.

F. Unused "knock-out" holes in concrete drop boxes shall be completely filled with concrete or mortar.

8.4. Distribution Boxes. Distribution boxes may be used on level or nearly level ground. They shall be watertight and constructed of concrete or other durable material approved by the Division. They shall be designed to accommodate 1 inlet pipe, the

necessary distribution lines, and shall meet the same requirements as for drop boxes, except that outlet inverts of the distribution box shall be not less than 2 inches below the inlet invert. Illustrations of typical components such as septic tanks, distribution boxes, and absorption systems are contained in an addendum to these rules, available through the Division of Water Quality

8.5. Identifying Marks. Commercially manufactured drop boxes and distribution boxes shall be plainly and legibly marked on an interior wall above the level of the top of the inlet pipe with the name of the manufacturer.

**R317-4-9. Absorption Systems.**

9.1. General Requirements.

A. Distribution pipe for gravity-flow absorption systems shall be four inches in diameter and shall be perforated. Distribution pipe and pipe fittings shall be of approved materials capable of withstanding corrosive action by sewage and sewage-generated gases, and meeting recognized national standards for compressive strength and corrosive action such as standards published by the American Society for Testing Materials (see R317-4-6).

B. Distribution pipe for gravity-flow absorption systems shall be in straight lengths and penetrated by at least two rows of round holes, each 1/4 to 1/2-inch in diameter, and located at approximately six -inch intervals. When installed on a level or nearly level grade, the perforations should be located at about the five o'clock and seven o'clock positions on the pipe to permit nearly equal drainage along the length of pipe, and the open ends of the pipes shall be capped.

C. Absorption system laterals designed to receive equal flows of wastewater shall have approximately the same absorption area. Many different designs may be used in laying out absorption systems, the choice depending on the size and shape of the available areas, the capacity required, and the topography of the disposal area.

D. In gravity-flow absorption systems with multiple distribution lines, the sewer pipe from the septic tank shall not be in direct line with any one of the distribution lines, except where drop boxes or distribution boxes are used.

E. Any section of distribution pipe laid with non-perforated pipe, shall not be considered in determining the required absorption area.

F. Absorption system excavations may be made by machinery provided that the soil in the bottom and sides of the excavation is not compacted. Strict attention shall be given to the protection of the natural absorption properties of the soil. Absorption systems shall not be excavated when the soil is wet enough to smear or compact easily. Open absorption system excavations shall be protected from surface runoff to prevent the

entrance of silt and debris. If it is necessary to walk in the excavation, a temporary board laid on the bottom will prevent damage from excessive compaction. Some smearing damage is likely to occur. All smeared or compacted surfaces should be raked to a depth of one inch, and loose material removed before the filter material is placed in the absorption system excavation.

G. The distribution pipe shall be bedded true to line and grade, uniformly and continuously supported on firm, stable material.

H. The top of the stone or "gravel" filter material shall be covered with an effective, pervious, material such as an acceptable synthetic filter fabric, unbacked fiberglass building insulation, a two-inch layer of compacted straw, or similar material before being covered with earth backfill to prevent infiltration of backfill into the filter material.

I. Absorption systems shall be backfilled with earth that is free from stones ten inches or more in diameter. The first four to six inches of soil backfill should be hand-filled. Distribution pipes shall not be crushed or disaligned during backfilling. When backfilling, the earth should be mounded slightly above the surface of the ground to allow for settlement and prevent depressions for surface ponding of water.

J. Heavy equipment shall not be driven in or over absorption systems during construction or backfilling.

K. Distribution pipes placed under driveways or other areas subjected to heavy loads shall receive special design considerations to insure against crushing or disruption of alignment. Absorption area under driveways or pavement shall not be considered in determining the minimum required absorption area, except that deep wall trenches and seepage pits may be allowed beneath unpaved driveways on a case-by-case basis by the regulatory authority, if the top of the distribution pipe is at least three feet below the final ground surface.

L. That portion of absorption systems below the top of distribution pipes shall be in natural earth or in earth fill which meets the requirements of R317-4-5.

M. A diversion valve may be installed in the sewer line after the septic tank to allow the use of rotating absorption systems. Such duplicate systems may be allowed in lieu of replacement areas. Total onsite wastewater system requirements shall remain the same. The valve shall be accessible from the finished grade. The valve should be switched annually.

N. Illustrations of typical absorption system components such as septic tanks, distribution boxes, and absorption systems are contained in an addendum to these rules, available through the Division of Water Quality

9.2. Standard Trenches. Standard trenches consisting of a series of trenches designed to distribute septic tank effluent into perforated pipe and gravel fill, from which it percolates through the trench walls and bottoms into the surrounding

subsurface soil, shall conform to the following requirements:

A. The effective absorption area of standard trenches shall be considered as the total bottom area of the excavated trench system in square feet.

B. The minimum required effective absorption area for standard trenches shall be determined from Table 7 by using the results of percolation tests conducted in accordance with R317-4-5. The minimum required effective absorptive area of trenches which utilize chamber systems shall be in accordance with R317-4-9.

C. Isolation of standard trenches shall be not less than the minimum distances specified in Table 2.

D. Design and construction of standard trenches shall be as specified in Tables 8 and 9.

TABLE 7
Subsurface Absorption Systems
Minimum Absorption Area Requirements and
Allowable Rate of Application of Wastewater
(Based on Percolation Test Rates)(a)

| Percolation Rate (time in minutes required for water to fall 1 inch) | Residential Minimum Absorption Area in Square Feet Per Bedroom (b)(c)(d) | Commercial, Institutional, etc., Maximum Rate of Application in gallons per sq. feet per day (e)(f)(g) |
|---|---|---|
| 1-10 | 165 | 1.6 |
| 11-15 | 190 | 1.3 |
| 16-20 | 212 | 1.1 |
| 21-30 | 250 | 0.9 |
| 31-45 | 300 | 0.8 |
| 46-60(g) | 330 | 0.6 |

FOOTNOTES

(a) Where practical, absorption areas should be increased above minimum figures specified in these rules.

(b) Minimum absorption requirements in the residential column of Table 7 provide for normal household appliances, including automatic sequence washers, mechanical garbage grinders, and dishwashers.

(c) Based on the number of bedrooms in use or that can be reasonably anticipated in the dwelling served, including the unfinished space available for conversion as additional bedrooms.

(d) Minimum absorption area is equal to the total number of bedrooms times the required absorption area within the applicable percolation rate category. In every case, sufficient absorption

area shall be provided for at least 2 bedrooms.

(e) Minimum absorption area is equal to the actual or estimated wastewater flow in gallons per day (Table 3) divided by the maximum rate of application in gallons per sq. ft. per day within the applicable percolation rate category. In every case a minimum of 150 square feet of trench bottom or sidewall absorption area shall be provided.

(f) Minimum application rates in the commercial and institutional column of Table 7 do not include wastes from garbage grinders and automatic sequence washing machines. Discharge from these appliances to a commercial or institutional absorption system require additional capacity of 20 percent for garbage grinders and 40 percent for automatic sequence washers above the minimum calculated absorption values. If both these appliances are installed, the absorption area must be increased by at least 60 percent above the minimum calculated absorption value.

(g) Soil absorption systems are not permitted in areas where the soil percolation rate is slower than one inch in 60 minutes or faster than one inch in one minute.

TABLE 8
Absorption Trench Construction Details(a)

| ITEM | UNIT | MINIMUM | MAXIMUM |
|---|---|---|---|
| GRAVITY EFFLUENT DISTRIBUTION PIPES: | | | |
| Number of laterals | -- | 2(b) | -- |
| Length of individual laterals | feet | -- | 100(c) |
| Diameter | inches | 4 | -- |
| Width of trenches | inches | 12 | 36 |
| Slope of distribution pipe | inches/100 ft. | (d) | 4 |
| Depth to trench bottom (from ground surface) | inches | 10 | (e) |
| Distance between trenches | | (see R317-4-9, Table 9) | |
| Bottom of trench to maximum ground water table | inches | 24 | -- |
| Bottom of trench to unsuitable soil or bedrock formations | inches | 48 | -- |
| SIZE OF FILTER MATERIAL | inches | 3/4 | 2-1/2 |
| Allowable fines: | | | |

| | | | | |
|---|---|---|---|---|
| 1/2 inch mesh(a) | percent | 0 | 5 |
| (12.5 millimeter) | | | |
| #10 mesh(a) | percent | 0 | 2 |
| (2.0 millimeter) | | | |
| (a) US Standard Sieves | | | |
| DEPTH OF FILTER MATERIAL: | | | |
| Under distribution pipe | inches | 6(f) | -- |
| Over distribution pipe | inches | 2 | -- |
| Total depth | inches | 12 | -- |
| Under pipe located within 10 feet of trees and shrubs | inches | 12 | -- |
| THICKNESS OF COMPACTED STRAW BARRIER OVER AGGREGATE FILTER MATERIAL | inches | 2 | -- |
| DEPTH OF BACKFILL OVER BARRIER COVERING FILTER MATERIAL | inches | 6(g) | -- |

FOOTNOTES

(a) The effective absorption area shall be considered as the total bottom area of the trenches in square feet.

(b) Of near equal length.

(c) Preferably not more than 60 feet long.

(d) Preferably level.

(e) Trenches should be constructed as shallow as is practical to allow for evapotranspiration of wastewater.

(f) Preferably 8 inches.

(g) Whenever any distribution pipes will be covered with between six and 12 inches of backfill, they shall be laid level, and adequate precautions shall be made to prohibit traffic or heavy equipment from the disposal area.

TABLE 9
Width and Minimum Spacing Requirements
for Absorption Trenches

| Width at Bottom in Inches | Minimum Spacing of Trenches (wall to wall) in Feet |
|---|---|
| 12 to 18 | 6.0 |
| 18 to 24 | 6.5 |
| 24 to 30 | 7.0 |
| 30 to 36 | 7.5 |

E. The stone or "gravel" fill used in absorption trenches shall consist of crushed stone, gravel, or similar material, ranging from 3/4 to 2 1/2 inches in diameter. It shall be free from fines, dust, sand, or organic material and shall be durable, and resistant to slaking and dissolution. The maximum fines in the gravel shall be two percent by weight passing through a US Standard #10 mesh (two millimeter) sieve. It shall extend the full width of the trench, shall be not less than six inches deep beneath the bottom of the distribution pipes, and shall completely encase and extend at least 2 inches above the top of the distribution pipe.

F. The distribution pipe shall be centered in the absorption trench and placed the entire length of the trench.

G. In locations where the slope of the ground over the absorption system area is relatively flat, the trenches should be interconnected to produce a closed-loop or continuous system and the distribution pipes should be level.

H. In locations where the ground over the absorption system area slopes greater than six inches in any direction within field area, a system of serial distribution trenches may be used which will follow approximately the ground surface contours so that variation in trench depth will be minimized. The trenches should be installed at different elevations, but the bottom of each individual trench should be level throughout its length.

I. Serial trenches shall be connected with a drop box (R317-4-8)or watertight overflow line (R317-4-9) in such a manner that a trench will be filled with wastewater to the depth of the gravel fill before the wastewater flows to the next lower trench.

J. The overflow line between serial trenches shall be a four-inch watertight pipe with direct connections to distribution pipes. It should be laid in a trench excavated to the exact depth required. Care must be exercised to insure a block of undisturbed earth between trenches. Backfill should be carefully tamped. Inlets should be placed as far as practical from overflows in the same trench.

9.3. Shallow Trenches with Capping Fill. Shallow trenches with capping fill are trenches which meet the requirements of standard trenches except for depth of installation. Shallow trenches with capping fill may be installed to a minimum depth of 10 inches from the natural existing grade to the bottom of the trench. The top of the distribution pipe shall not be installed above the natural existing grade. The gravel fill above the pipe, the filter media barrier, and the soil fill are installed as a "cap" to the trench above grade. Fill shall be installed between trenches to prevent surface ponding and to provide a level finished grade.

9.4. Chambered Trench Systems.

A. At the option of the local health department, chamber system media may be used in lieu of the gravel fill and perforated distribution pipe in absorption trenches if the installation is in

conformance with manufacturer recommendations, as modified by these rules.

B. No cracked, weakened or otherwise damaged chamber units shall be used in any installation.

C. All chambers shall be manufactured of an approved material and shall be certified to withstand the AASHTO H-10-44 highway structural rating without damage or permanent deformation.

1. Type A Chamber Media:

a. Type A Chamber Media shall be of an approved design with a minimum width at the bottom of 30 inches (76 cm) and a minimum louvered sidewall opening height of six inches (15 cm).

b. Type A chamber media may be installed in standard trenches, shallow trenches with capping fill, at-grade trenches, and earth-fill trenches.

c. Type A chamber media shall be installed in trenches with a minimum excavation width of 36 inches (91 cm).

d. The minimum total length of Type A chamber media installed shall be equal or greater than the minimum length of a 36 inch wide gravel media trench as required by these rules.

2. Type B Chamber Media:

a. Type B Chamber Media shall be of an approved design with a minimum open bottom width of 18 inches (46 cm) and a minimum louvered sidewall opening height of 9-3/8 inches (24 cm).

b. The local health department shall provide written notification to the owner that they are using technology which has less experience than the conventional gravel filled trench. The potential liabilities of the system shall be clearly explained, including the responsibility a homeowner has to replace a failing wastewater system.

c. Type B chamber media may only be installed in standard trenches and shallow trenches with capping fill. Type B chambers may not be installed in conjunction with any other absorption system configuration, including alternative and experimental systems.

d. Type B chamber media shall be installed in trenches with a minimum excavation width of 24 inches (61 cm).

e. The bottom of the Type B chamber media and trench excavation shall be a minimum of 9-3/8 inches below the bottom invert of the effluent inlet pipe to the trench.

f. The minimum total length of Type B chamber media installed shall be equal or greater than the minimum length of a 36 inch (91 cm) wide gravel media trench as required by these rules.

9.5. Deep Wall Trenches.

A. Deep wall trenches may be constructed in lieu of other approved absorption systems or as a supplement to an absorption trench where soil conditions and the required separation from the maximum ground water table comply with Table 11 of this section. This absorption system consists of deep trenches filled with clean, coarse filter material which receive septic tank effluent

and allow it to seep through sidewalls into the adjacent porous subsurface soil. They shall conform to the following requirements:

1. The effective absorption areas shall be considered as the outside surface of the deep wall trench (vertical sidewall area) calculated below the inlet or distributing pipe, exclusive of any unsuitable soil or bedrock formations. The bottom area and any highly restrictive or impervious strata or bedrock formations shall not be considered in determining the effective sidewall absorption area. Each deep wall trench shall have a minimum sidewall absorption depth of 2 feet of suitable soil formation.

2. The minimum required sidewall absorption area shall be determined by either of the following 2 methods:

a. For the purpose of estimating the percolation test rate of each deep wall trench system, a signed " Deep Wall Trench Certificate" or equivalent shall be submitted as evidence that a proper percolation test has been performed under the supervision of a licensed environmental health scientist, registered engineer, or other qualified person certified by the regulatory authority. The deep wall trench certificate or equivalent must contain the following:

i. the name and address of the individual constructing the deep wall trench;

ii. the location of the property;

iii. the dimensions of the trench;

iv. total effective absorption depth;

v. a description of the texture, character, and thickness of each stratum of soil encountered in the deep wall trench construction;

vi. a signed statement certifying that the deep wall trench has been constructed in accordance with the requirements of this rule. The required absorption area shall then be determined in accordance with Table 10.

b. Percolation tests conducted in accordance with R317-4-5 shall be made in each soil horizon penetrated by the deep wall trench below the inlet pipe, and test results within the acceptable range specified in R317-4-5 shall be used in calculating the required sidewall absorption area in accordance with Table 7.

TABLE 10
Deep Wall Trench
Minimum Absorption Area Requirements and
Allowable Rate of Application of Wastewater (a)
(Based on Soil Descriptions According to the
United States Department of Agriculture (USDA)
Soil Classification System)

| Character of Soil by USDA Soil | Residential Sq. Ft. of | Commercial, Institutional, |
|---|---|---|

| Classification System | Sidewall Area Required Per Bedroom (b)(c)(d) | etc. Maximum Rate of Application in Gallons Per Sq. Ft. Sidewall Per Day (e)(f) |
|---|---|---|
| Hardpan or bedrock (including fractured bedrock with little or no fines). | (g) | (g) |
| Sand Well graded gravels, gravel-sand mixtures, little or no fines. | 150 (h)(i) | 1.55 (h)(i) |
| Sand Poorly graded gravels or gravel-sand mixtures, little or no fines. | 150 (h)(i) | 1.55 (h)(i) |
| Loamy Sand Well graded sands, gravelly sand, little or no fines. | 195 | 1.20 |
| Loamy Sand Poorly graded sands or gravelly sands, little or no fines. | 195 | 1.20 |
| Loam Silty sand, sand-silt mixtures. | 295 | 0.8 |
| Sandy Loam Silty gravels, poorly graded gravel-sand-silt mixtures. | 235 | 1.0 |
| Silty Loam Clayey gravels, gravel-sand-clay mixtures. | 520 (i) | 0.45 (i) |
| Silty Loam, Silt, Sandy Clay Loam Silty Clay Loam Sandy Clay Silty Clay Clayey sands, sand-clay mixtures. | 520 (i) | 0.45 (i) |
| Silty Loam, Silt, Sandy Clay Loam Silty Clay Loam Sandy Clay Silty Clay Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight | | |

| | | | |
|---|---|---|---|
| plasticity. | 520 (i) | 0.45 (i) |
| Silty Loam, Silt, Sandy Clay Loam Silty Clay Loam Sandy Clay Silty Clay | Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts. | 520 (h)(i) | 0.45 (h)(i) |
| Silty Loam, Silt, Sandy Clay Loam Silty Clay Loam Sandy Clay Silty Clay | Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays. | 520 (h)(i) | 0.45 (h)(i) |
| Clay Loam, Clay | Inorganic clays of high plasticity, fat clays. | (g) | (g) |
| Clay Loam, Clay | Organic silts and organic silty clays of low plasticity. | (g) | (g) |
| Clay Loam, Clay | Organic clays of medium to high plasticity, organic silts. | (g) | (g) |
| Clay Loam, Clay | Peat and other highly organic silts. | (g) | (g) |

FOOTNOTES

(a) Where practical, absorption areas should be increased above minimum figures specified in these rules.

(b) Minimum absorption requirements in the residential column of Table 10 provide for normal household applications, including automatic sequence washers, mechanical garbage grinders, and dishwashers.

(c) Based on the number of bedrooms in use or that can be reasonably anticipated in the dwelling served, including the unfinished space available for conversion as additional bedrooms.

(d) Minimum absorption area is equal to the total number of bedroom times the required absorption area within the applicable soils description category. In every case, sufficient absorption area shall be provided for at least two bedrooms.

(e) Minimum absorption area is equal to the actual or estimated wastewater flow in gallons per day (Table 3) divided by

the maximum rate of application in gallons per sq. ft. per day within the applicable soils description category. In every case, a minimum of 150 sq. ft. of sidewall absorption area shall be provided.

(f) Minimum application rates in the commercial and institutional column of Table 5 do not include wastes from garbage grinders and automatic sequence washing machines. Discharge from these appliances to a commercial or institutional absorption system require additional capacity of 20 percent for garbage grinders and 40 percent for automatic sequence washers above the minimum calculated absorption values. If both these appliances are installed, the absorption area must be increased by at least 60 percent above the minimum calculated absorption value.

(g) Unsuitable for absorption area.

(h) These soils are usually considered unsuitable for absorption systems, but may be suitable, depending upon the percentage and type of fines in coarse-grained porous soils, and the percentage of sand and gravels in fine-grained soils.

(i) For the purposes of this table, whenever there are reasonable doubts regarding the suitability and estimated absorption capacities of soils, percolation tests shall be conducted in those soils in accordance with R317-4-5. Soils within the same classification may exhibit extreme variability in permeability, depending on the amount and type of clay and silt present. The following soil categories, Clay loam and Clay soils, may prove unsatisfactory for absorption systems, depending upon the percentage and type of fines present.

3. Isolation of deep wall trenches shall be not less than the minimum distances specified in Table 2.

4. Design and construction of deep wall trenches shall be as specified in Table 11.

5. The bottom of the deep wall trench shall terminate at least two feet above the maximum ground water table in the disposal area. Suitable soil conditions must be verified to a depth of four feet below the bottom of the proposed deep wall trench.

6. All deep wall trenches shall be filled with coarse stone that ranges from 3/4 to twelve inches in diameter and is free from fines, sand, clay, or organic material.

7. The distribution pipe shall be centered in the deep wall trench and placed the entire length of the trench. A thin layer of crushed rock or gravel ranging from 3/4 to 2 1/2 inches in diameter and free from fines, sand, clay or organic material, shall cover the coarse stone to permit leveling of the distribution pipe. The maximum fines in the gravel used above the stone shall be two percent by weight passing through a US Standard #10 mesh (2.0 millimeter) sieve. The crushed rock or gravel shall completely fill the trench to a minimum depth of two inches over the distribution pipe and shall be properly covered in accordance

with R317-4-9 to prevent infiltration of backfill. A minimum of six inches of backfill shall cover the crushed rock or gravel over the distribution pipe.

TABLE 11
Deep Wall Trench Construction Details (a)

| ITEM | UNIT | MINIMUM | MAXIMUM |
|---|---|---|---|
| DEEP WALL TRENCHES: | | | |
| Width | feet | 2 | -- |
| Length | feet | -- | 100 (b) |
| EFFECTIVE VERTICAL SIDEWALL ABSORPTION DEPTH (per trench) | feet | 2 | -- |
| EFFLUENT DISTRIBUTION PIPES: | | | |
| Diameter | inches | 4 | -- |
| Slope | inches/100 ft. (c) | 4 | |
| BOTTOM OF TRENCH TO MAXIMUM GROUND WATER TABLE | inches | 24 | -- |
| BOTTOM OF TRENCH TO UNSUITABLE SOIL OR BEDROCK FORMATIONS | inches | 48 | -- |
| DISTANCE BETWEEN DEEP WALL TRENCHES | (See Table 2) | | |
| SIZE OF FILTER MATERIAL | inches | 3/4 | 12 |
| DEPTH OF FILTER MATERIAL: | | | |
| Under pipe | feet | 2 (d) | -- |
| Over pipe | inches | 2 | -- |
| THICKNESS OF COMPACTED STRAW BARRIER OVER AGGREGATE FILTER MATERIAL | inches | 2 | -- |
| DEPTH OF BACKFILL OVER BARRIER COVERING FILTER MATERIAL | inches | 6 (e) | -- |

FOOTNOTES

(a) The effective absorption area shall be considered as the outside surface of the deep wall trench (vertical sidewall area) calculated below the distribution pipe, exclusive of any unsuitable soil or bedrock formations. The bottom area and any highly restrictive or impervious sidewall strata shall not be considered in determining the effective absorption area.

(b) Preferably not more than 60 feet long.

(c) Preferably level.

(d) For a deep wall trench, the entire trench shall be completely filled with aggregate filter material to at least the top of any permeable soil formation to be calculated as effective sidewall absorption area.

(e) Whenever any distribution pipes will be covered with between six and twelve inches of backfill, they shall be laid level, and adequate precautions shall be made to prohibit traffic or heavy equipment from the disposal area.

8. If multiple deep wall trenches are installed in areas where the slope of the ground is relatively flat, the trenches and distribution pipes should be interconnected to produce a continuous system and the distribution pipe and trench bottoms should be level.

9. In locations where the ground over the deep wall trench area slopes, a single trench system should follow the contours of the land. If multiple trenches are necessary on sloping land, a system of serial deep wall trenches should be used, with each trench installed at a different elevation. The bottom of each trench should be level throughout its length.

10. Illustrations of typical absorption system components such as septic tanks, distribution boxes, and absorption systems are contained in an addendum to these rules, available through the Division of Water Quality

9.6. Seepage Pits. Seepage pits shall be considered as modified deep wall trenches and may be constructed in lieu of other approved absorption systems or as a supplement to an absorption trench where soil conditions and the required separation from the maximum ground water table comply with R317-4-5. This absorption system consists of one or more deep pits, either (1) hollow-lined, or (2) filled with clean, coarse filter material, which receive septic tank effluent and allow it to seep through sidewalls into the adjacent porous subsurface soil. They shall conform to the general requirements for deep wall trenches, except for the following:

A. The effective absorption area for seepage pits shall be determined as for deep wall trenches in R317-4-9, except that each seepage pit shall have a minimum effective sidewall absorption depth of four feet of suitable soil formation.

B. The minimum required sidewall absorption area shall be determined as for deep wall trenches in R317-4-9.

C. Design and construction of seepage pits shall be as specified in Table 12.

TABLE 12
Seepage Pits Construction Details (a)

| ITEM | UNIT | MINIMUM | MAXIMUM |
|---|---|---|---|

| | | | |
|---|---|---|---|
| GENERAL: | | | |
| Diameter of pit | feet | 3 | -- |
| Effective vertical sidewall absorption depth (per pit) | feet | 4 | -- |
| Distance between seepage pits | (See Table 2) | | |
| Diameter of distribution pipe | inches | 4 | -- |
| Size of filter material | inches | 3/4 | 12 |
| HOLLOW-LINED PITS: | | | |
| Width of annular space between lining and sidewall containing crushed rock (3/4 to 2-1/2 inches in diameter) | inches | 6 (b) | -- |
| Thickness of reinforced perforated concrete lining | inches | 2-1/2 | -- |
| Thickness of brick, or block linings | inches | 4 | -- |
| Depth of filter material in pit bottom | inches | 6 | -- |
| Horizontal dimension of manhole in cover | inches | 18 | -- |
| FILLED SEEPAGE PITS: | | | |
| Depth of filter material: | | | |
| Under distribution pipe | feet | 4 (c) | -- |
| Over distribution pipe | inches | 2 | -- |
| Thickness of compacted straw barrier over aggregate filter material | inches | 2 | -- |
| Depth of backfill over barrier covering filter material | inches | 6 (d) | -- |

FOOTNOTES

(a) The effective absorption area shall be considered as the outside surface of the seepage pit (vertical sidewall area) calculated below the inlet or distribution pipe, exclusive of any unsuitable soil or bedrock formations. The bottom area and any

highly restrictive or impervious sidewall strata shall not be considered in determining the effective absorption area.

(b) Preferably twelve inches.

(c) For a filled seepage pit, the entire pit shall be completely filled with aggregate filter material to at least the top of any permeable soil formation to be calculated as effective sidewall absorption area.

(d) Whenever any distribution pipes will be covered with between six and 12 inches of backfill, they shall be laid level, and adequate precautions shall be made to prohibit traffic or heavy equipment from the disposal area.

D. All seepage pits shall have a diameter of at least three feet.

E. Structural materials used throughout shall assure a durable, safe structure.

F. All seepage pits shall be either (1) hollow and lined with an acceptable material, or (2) filled with coarse stone or similar material that ranges from 3/4 to 12 inches in diameter and is free from fines, sand, clay, or organic material. Pits filled with coarse stone are preferred over hollow-lined pits. Linings of brick, stone, block, or similar materials shall have a minimum thickness of four inches and shall be laid with overlapping, tight-butted joints. Below the inlet level, mortar shall be used in the horizontal joints only. Above the inlet, all joints shall be fully mortared.

G. For hollow-lined pits, the inlet pipe should extend horizontally at least 1 foot into the pit with a tee to divert flow downward and prevent washing and eroding the sidewall. A minimum annular space of six inches between the lining and excavation wall shall be filled with crushed rock or gravel varying in diameter from 3/4 to 2-1/2 inches and free from fines, sand, clay, or organic material. The maximum fines in the gravel shall be 2 percent by weight passing through a US Standard #10 mesh (2.0 millimeter) sieve. Clean coarse gravel or rock at least six inches deep shall be placed in the bottom of each pit.

H. A structurally sound and otherwise suitable top shall be provided that will prevent entrance of surface water, dirt, or other foreign material, and be capable of supporting the overburden of earth and any reasonable load to which it is subjected. Access to each hollow-lined pit shall be provided by means of a manhole, not less than 18 inches in minimum horizontal dimension, or by means of an easily removable cover and shall otherwise comply with R317-4-7. The top of the pit shall be covered with a minimum of six inches of backfill.

I. In pits filled with coarse stone, the perforated distribution pipe shall run across each pit. A layer of crushed rock or gravel shall be used for leveling the distribution pipe as specified in R317-4-9.

9.7. Absorption Beds. Absorption beds consist of large

excavated areas, usually rectangular, provided with "gravel" filter material in which 2 or more distribution pipe lines are laid. They may be used in lieu of other approved absorption systems where conditions justify their use and shall conform to the requirements applying to absorption trenches, except for the following:

A. The effective absorption area of absorption beds shall be considered as the total bottom area of the excavation.

B. The minimum required absorption area for absorption beds shall be determined from Table 13 by using the results of percolation tests conducted in accordance with R317-4-5.

TABLE 13
Absorption Bed
Minimum Absorption Area Requirements and
Allowable Rate of Application of Wastewater
(Based on Percolation Test Rates) (a) (b)

| Percolation Rate (time in minutes required for water to fall 1 inch) | Residential Minimum Absorption Area in Square Feet Per Bedroom (c)(d) | Commercial, Institutional, etc., Maximum Rate of Application in gallons per square foot per day (e)(f) |
|---|---|---|
| 1-10 (g) | 330 | 0.80 |
| 11-15 | 380 | 0.65 |
| 16-20 | 424 | 0.55 |
| 21-30 (g) | 500 | 0.45 |

FOOTNOTES

(a) Where practical, absorption areas should be increased above minimum figures specified in these rules.

(b) This table provides for the normal household appliances, including automatic sequence washers, mechanical garbage grinders, and dishwashers.

(c) Based on the number of bedrooms in use or that can be reasonably anticipated in the dwelling served, including the unfinished space available for conversion as additional bedrooms.

(d) Minimum absorption area is equal to the total number of bedrooms times the required absorption area within the applicable percolation rate category. In every case, sufficient absorption area shall be provided for at least two bedrooms.

(e) Minimum absorption area is equal to the actual or estimated wastewater flow in gallons per day (Table 3) divided by the maximum rate of application in gallons per sq. ft. per day within the applicable percolation rate category. In every case, a minimum of 300 square feet of absorption bed bottom absorption

area shall be provided.

(f) Minimum application rates in the commercial and institutional column of Table 7 do not include wastes from garbage grinders and automatic sequence washing machines. Discharge from these appliances to a commercial or institutional absorption system require additional capacity of 20 percent for garbage grinders and 40 percent for automatic sequence washers above the minimum calculated absorption values. If both these appliances are installed, the absorption area must be increased by at least 60 percent above the minimum calculated absorption value.

(g) Absorption beds are not permitted in areas where the soil percolation rate is slower than one inch in 30 minutes or faster than one inch in one minute.

C. Isolation of absorption beds shall be not less than the minimum distances specified in Table 2.

D. Design and construction of absorption beds shall be as specified in Table 14.

TABLE 14
Absorption Bed Construction Details (a)

| ITEM | UNIT | MINIMUM | MAXIMUM |
|---|---|---|---|
| EFFLUENT DISTRIBUTION PIPES: | | | |
| Diameter | inches | 4 | -- |
| Length | feet | -- | 100 (b) |
| Number of lines | -- | 2 (c) | -- |
| Slope | inches/100 ft. | (d) | 4 |
| Depth of absorption bed (from ground surface) | inches | 12 | (e) |
| DISTANCE BETWEEN MULTIPLE LINES (c to c) | feet | -- | 6 |
| DISTANCE BETWEEN DISTRIBUTION LINES AND SIDEWALLS (edge to edge) | feet | 1 | 3 |
| DISTANCE BETWEEN ABSORPTION BEDS | (See Table 2) | | |
| BOTTOM OF BED TO MAXIMUM GROUND WATER TABLE | feet | 2 | -- |
| BOTTOM OF TRENCH TO UNSUITABLE SOIL OR BEDROCK FORMATIONS | feet | 4 | -- |
| SIZE OF FILTER MATERIAL | inches | 3/4 | 2-1/2 |
| Allowable fines: | | | |

| | | | |
|---|---|---|---|
| 1/2 inch mesh(a) | percent | 0 | 5 |
| (12.5 millimeter) | | | |
| #10 mesh(a) | percent | 0 | 2 |
| (2.0 millimeter) | | | |
| (a) US Standard Sieves | | | |
| DEPTH OF FILTER MATERIAL: | | | |
| Under pipe | inches | 6 (f) | -- |
| Over pipe | inches | 2 | -- |
| Total | inches | 12 | -- |
| Under pipe located within 10 feet of trees or shrubs | inches | 12 | -- |
| THICKNESS OF COMPACTED STRAW BARRIER OVER AGGREGATE FILTER MATERIAL | inches | 2 | -- |
| DEPTH OF BACKFILL OVER BARRIER COVERING FILTER MATERIAL | inches | 6 (g) | -- |

FOOTNOTES

(a) The effective absorption area shall be considered as the total bottom area of the excavation in square feet.

(b) Preferably not more than 60 feet long.

(c) Of near equal length.

(d) Preferably level.

(e) Absorption beds should be constructed as shallow as is practical to allow for evapotranspiration of wastewater.

(f) Preferably eight inches.

(g) Whenever any distribution pipes will be covered with between six and twelve inches of backfill, they shall be laid level, and adequate precautions shall be made to prohibit traffic or heavy equipment from the disposal area.

E. Absorption beds should be installed where the slope of the ground surface is relatively level, sloping no more than about six inches from the highest to the lowest point in the installation area. The bottom of the entire absorption bed shall be essentially level, at the same elevation, and the distribution pipes shall be interconnected to produce a continuous system.

**R317-4-10. Experimental Onsite Wastewater Systems.**

10.1. Administrative Requirements.

A. Where unusual conditions exist, experimental methods of onsite wastewater treatment and disposal may be employed provided they are acceptable to the Division and to the local health department having jurisdiction.

B. When considering proposals for experimental onsite wastewater systems, the Division shall not be restricted by this

rule provided that:

1. The experimental system proposed is attempting to resolve an existing pollution or public health hazard, or when the experimental system proposal is for new construction, it has been predetermined that an acceptable back-up wastewater system will be installed in event of failure of the experiment.

2. The proposal for an experimental onsite wastewater system must be in the name of and bear the signature of the person who will own the system.

3. The person proposing to utilize an experimental system has the responsibility to maintain, correct, or replace the system in event of failure of the experiment.

C. When sufficient, successful experience is established with experimental onsite wastewater systems, the Division may designate them as approved alternative onsite wastewater systems. Following this approval of alternative onsite wastewater systems, the Division will adopt rules governing their use.

10.2. General Requirements.

A. All experimental systems shall be designed, installed and operated under the following conditions:

1. The ground water requirements shall be determined as shown in R317-4-5.

2. The local health department must advise the owner of the system of the experimental status of that type of system. The advisory must contain information concerning risk of failure, level of maintenance required, financial liability for repair, modification or replacement of a failed system and periodic monitoring requirements which are all specific to the type of system to be installed.

3. The local health department and the homeowner shall be provided with sufficient design, installation and operating information to produce a successful, properly operating installation.

4. The local health department is responsible for provision of, or oversight of an approved installation, inspection and maintenance and monitoring program for the systems. Such programs shall include approved procedures for complete periodic maintenance and monitoring of the systems.

5. The local health department may impose more stringent design, installation, operating and monitoring conditions than those required by the Division.

6. All failures, repairs or alterations shall be reported to the local health department. All repairs or alterations must be approved by the local health department.

B. When an experimental wastewater system exists on a property, notification of the existence of that system shall be recorded on the deed of ownership for that property.

**R317-4-11. Alternative Systems.**

11.1. General Requirements.

A. The health department will review and approve sufficient design, installation and operating information to produce a successful, properly operating installation from a designer certified at Level 3 in accordance with the requirements of R317-11.

B. The designer must submit:

1. detailed basis of design of all components with:

a. necessary and relevant calculations, and,

b. justification of process design variables with statistically significant and demonstrated performance among coorelated variables, from the existing installations, and sensitivity evaluation of performance variables, where required to supplement or substitute design criteria stated in this rule.

2. operation and maintenance instructions for the system to the health department and to the owner, [~~The instructions must~~] which describe the activities necessary to properly operate and maintain and troubleshoot the system. [~~Trouble shooting information must also be included.~~]

C. All requirements stated elsewhere in this rule for design, construction and installation details, performance, failures, repairs and abandonment shall apply unless stated differently for a given alternative system.

11.2. At-Grade Systems.

A. Design Requirements.

1. Absorption trenches and absorption bed type absorption systems may be placed in the at-grade position provided:

a. Invert of effluent distribution pipe or the bottom of the absorption trench is placed at the native ground surface.

b. the elevation of the anticipated maximum ground water table shall be:

i. at least 24 inches below the bottom of the absorption system excavation; and,

ii. at least 48 inches below finished grade.

c. at least 48 inches of suitable soil percolating between:

i. one and 60 minutes per inch for absorption trench, or,

ii. one to 30 minutes per inch for absorption beds is available between bedrock or impervious strata and the bottom of the absorption system excavation.

d. The native ground surface does not slope more than four percent for installation of an at-grade system.

e. all other requirements of this rule for:

i. minimum horizontal distances from the stated feature to the toe of the finished at-grade system in Table 2,

ii. area requirements and construction details for absorption trenches in Tables 7, 8 and 9,

iii. area requirements and construction details for absorption beds in Tables 13 and 14, are met.

2. Minimum of two observation ports shall be provided within absorption area.

B. Construction Details.

1. The site shall be cleared of vegetation.

2. The soil at the surface shall be loosened and broken up to an approximate depth of six inches.

3. No rotary tilling shall be permitted.

4. Any furrows resulting from the scarification shall be perpendicular to any slope on the site.

5. When fill is placed where finished contours are above the natural ground surface, it shall extend from the center of the wastewater system at the same general top elevation for a minimum of ten feet in all directions beyond the limits of the disposal area perimeter below, before the beginning of the side slope.

6. The site shall be graded such that surface water drains away from the onsite wastewater system and adjoining area.

7. The maximum side slope for above ground fill shall be four (horizontal) to one (vertical).

11.3 Earth fill systems.

A. Design Requirements.

1. Earth fill may be added to a site or naturally existing soil with a percolation rate less than one minute per inch or more than 60 minutes per inch may be removed and replaced with earth fill with an acceptable, in-place percolation rate, if:

2. the removal of the original soil does not cause other unacceptable site conditions, and, wastewater ponding will not occur below the bottom of the absorption system;

3. the elevation of the anticipated maximum ground water table shall be:

a. at least 12 inches below the natural ground surface, and,

b. at least 24 inches below the bottom of absorption trench.

4. Minimum depth of suitable soil percolating between one and 60 minutes per inch available between bedrock or impervious strata and:

a. the native ground surface must not be less than 36 inches, or,

b. the bottom of the absorption system trench must not be less than 48 inches, which ever is greater.

5. all other requirements of this rule for:

a. minimum horizontal distances in Table 2,

b. area requirements and construction details for absorption trenches in Tables 7, 8 and 9, are met.

6. The fill area shall be sufficient to:

a. accommodate an absorption system for a home with a minimum of three bedrooms, and shall include all required clearances within, and outside of the fill and absorption system area.

b. install a system sized for greater of three bedrooms or the planned number of bedrooms in the home, using the percolation rate of 60 minutes per inch.

c. include the area required for a 100 percent replacement of the absorption system, with all required clearances.

7. The area between trenches shall not be used for

replacement area.

8. The earth fill shall be considered to be acceptably stabilized if it is allowed to naturally settle for a minimum period of one year, sized to result in its minimum required dimensions after the settling period. Mechanical compaction shall not be allowed.

9. After the fill has settled for a minimum of one year, a minimum of two (2) percolation tests/soil exploration tests shall be conducted in the fill. One shall be conducted in the proposed absorption system area and one in the proposed replacement area of the fill. The suitably stabilized fill shall have an in-place percolation rate of between 15 and 45 minutes per inch.

10. The native ground surface does not slope more than four percent for installation of an earth fill system. [~~Maximum acceptable slope of original site surface for placement of an earth fill system is four percent.~~]

11. The fill depth below the bottom of the absorption system to the native ground surface shall not exceed six feet.

12. Minimum of two observation ports shall be provided within absorption area.

B. Construction Details.

1. The site shall be cleared of vegetation.

2. The surface soil shall be loosened and broken up to an approximate depth of six inches.

3. No rotary tilling shall be permitted.

4. Any furrows resulting from the scarification shall be perpendicular to any slope on the site.

5. The site shall be graded such that surface water drains away from the onsite wastewater system and adjoining area.

6. The maximum exposed side slope for fill surfaces shall be four horizontal to one vertical.

7. When fill is placed where finished contours are above the natural ground surface, it shall extend from the center of the wastewater system at the same general top elevation for a minimum of ten feet in all directions beyond the limits of the disposal area perimeter below, before the beginning of the side slope.

8. A suitable soil cap, which will support a vegetative cover, shall cover the entire fill body. The cap shall be provided with a vegetative cover. Access to the fill site shall be restricted to minimize erosion and other physical damage.

11.4 Mound systems.

A. Design Requirements.

1. Mound system may be built over naturally existing soils with a percolation rates between one to 60 minutes per inch provided:

a. the elevation of the anticipated maximum ground water table shall be at least 12 inches below the natural ground surface.

b. a minimum of one foot of approved sand and one foot of

natural soil percolating between one to 60 minutes per inch is available to form the minimum two feet of unsaturated soil below the bottom of the absorption system.

c. at least 36 inches of suitable soil percolating between one and 60 minutes per inch is available between bedrock or impervious strata and the native ground surface.

d. The native ground surface does not slope more than 25 percent for installation of a mound system.

2. all other requirements of this rule for[~~÷~~]minimum horizontal distances in Table 2 are met.

[~~a. , and,~~]

[~~b. installation in sloping ground~~]

3. The design shall be based on:

a. a minimum of 300 gallons per day for two bedrooms with [~~150~~]100 gallons per day for each additional bedroom.

b. Linear hydraulic loading rate ranging from three to eight gallons per day per foot based on flow being shallow or away from the mound and primarily lateral or downward. [~~of:~~

~~i. three to four gallons per day per foot when the flow is shallow and primarily lateral, or,~~

~~ii. eight to ten gallons per day per foot when the flow is away from the system and primarily downward.~~]

c. Sand fill hydraulic loading rate shall not be greater than 0.8 gallons per day per square foot of absorption system bottom area.

d. Soil (basal) hydraulic loading or application rate at sand fill to native soil interface using a relationship: q (gallons per day per square foot) = 1.2995 x percolation rate (minutes per inch) ^ -0.4421, or as shown in Table 15:

Table 15
Effluent loading rates
from sand fill to native soil interface
(Based on Percolation Test Rates)

| Percolation Rate (time in minutes required for water to fall one inch) | gallons per day per square foot |
|---|---|
| 1-10 | 0,45 |
| 11-15 | 0.40 |
| 16-20 | 0.35 |
| 21-30 | 0.30 |
| 31-45 | 0.25 |
| 46-60 | 0.20 |

e. Distribution Cell (Refer to the graphic available for [~~nomen cloture~~] nomenclature from the Division):

i. Area (A x B) shall be the ratio of design flow and sand fill hydraulic loading rate, where the maximum width (A) shall be

ten feet,

ii. Length (B) shall be the ratio of[~~:~~

~~(1). linear hydraulic loading rate and the design flow when soil application rate is less than 0.3 gallons per day per square foot, or,~~

~~(2). linear hydraulic loading rate and the design flow when soil application rate is less than 0.3 gallons per day per square foot, or,~~]design flow and linear hydraulic loading. [~~whichever is greater~~]

f. Mound fill depth (D) shall be the difference of a minimum of four feet of suitable soil percolating between one and 60 minutes per inch under the absorption system (aggregate and sand fill interface), and, a minimum of two feet.

g. Mound fill depth at down slope edge (E) shall be the sum of Mound fill depth (D) and Absorption area width (A), times the slope of the native ground surface expressed as a decimal.

h. Mound Depth (F) shall be the sum of depth of aggregate (not less than six inches) and depth of aggregate cover over the distribution pipe (not less than two inches), and, nominal diameter of distribution pipe.

i. The minimum depth of cover shall be 12 inches at distribution cell edges (G), and 18 inches at the center of distribution cell (H).

j. Down slope width (I) shall be greater of:

i. Fill depth at the down slope edge of distribution cell ( Mound fill depth at down slope edge (E) + Mound Depth (F) + depth of cover at distribution cell edges (G)) x horizontal gradient of side slope (3 if 3:1) x slope correction factor which is (100 / (100 - (3 x per cent of slope) if 3:1), or,

ii. difference of ratio of linear loading and soil application rates and liner loading and sand fill loading rates.

k. Up slope width (J) shall be: Fill depth at the up slope edge of distribution cell ( Mound fill depth (D) + Mound Depth (F) + depth of cover at distribution cell edges (G)) x horizontal gradient of side slope (3 if 3:1) x slope correction factor which is (100 / (100 +(3 x per cent of slope) if 3:1).

l. End slope width (K) shall be: Total fill at the center of distribution cell (Mound fill depth (D) + Mound fill depth at down slope edge (E))/2) + Mound Depth (F) + depth of cover at the center of distribution cell (H) ) x horizontal gradient of side slope (3 if 3:1).

m. Fill length (L) shall be: Distribution cell length (B) + 2 x end slope width (K).

n. Details on [~~D~~]depth, width and length of distribution cell, sand fill and aggregate, effluent distribution, design and construction not covered herein, [~~shall~~] should be as [~~required~~]referred to in Mound Component Manual Version 2, Wisconsin Department of Commerce, January 2001, available from the Division.

o. Effluent distribution shall be pressurized.

p. Minimum of two observation ports shall be provided within absorption area.

B. Construction Details.

1. The site shall be cleared of vegetation and scarified to an approximate depth of six inches. Any furrows resulting from the scarification shall be perpendicular to any slope on the site.

2. The surface soil shall be loosened and broken up to an approximate depth of six inches.

3. The site shall be graded such that surface water drains away from the onsite wastewater system and adjoining area.

4. The minimum thickness of aggregate media around the distribution pipes of the absorption system shall be the sum of six inches below the distribution pipe, the diameter of the distribution pipe and two inches above the distribution pipe or ten inches, whichever is larger.

5. The material for soil cap shall not be less than six inches in thickness and provide protection against erosion, frost, storm water infiltration and support vegetative growth and aeration of distribution cell.

6. Fill material [~~Sand fill~~] must meet ASTM Specification C-33 for fine aggregate. Textural analysis of fill material in accordance with ASTM C-136 is required for determining suitability.

7. A minimum of two observation pipes shall be located at opposite end of each distribution cell and 1/5 to 1/10 the length of distribution cell measured from the end of the cell.

8. Distribution laterals must be:

a. of 3/4 inch to 3 inch in diameter;

b. placed within four feet of each other within distribution cell;

c. provided with a stand pipe for access from the surface for cleaning;

d. provided with orifices:

i. 1/4 or 3/16 inches inch in diameter;

ii. spaced between 30 to 36 inches, and

iii. between six inches to two feet from the edge of distribution cell.

9. Distal head in a lateral must be no less than 2.5 feet for 1/4-inch diameter orifice and 3.5 ft for 3/16-inch diameter orifice.

10. An automatic visual or audible alarm indicating the failure of the pump shall be provided, and shall remain on until turned off manually.

11.5. Packed Bed Media systems.

A. Design Requirements.

1. Packed bed media systems may be used provided:

a. the elevation of the anticipated maximum ground water table shall be at least 12 inches below the natural ground surface, or, the bottom of absorption trench or bed or drip irrigation piping whichever is greater.

b. acceptable percolation rate for packed bed media system effluent dispersal is up to 120 minutes per inch;

c. at least 36 inches of suitable soil below the bottom of the absorption trench, percolating between one and 120 minutes per inch is available for packed bed media system effluent dispersal, between bedrock or impervious strata and the native ground surface.

d. At least 18 inches of suitable soil percolating between one and 120 minutes per inch is available for packed bed media system effluent dispersal, between bedrock or impervious strata and the native ground surface with an evaluation of infiltration rate and hydrogeology from a professional geologist or [~~geotechnical~~] engineer licensed to practice in Utah with an expertise in geotechnical engineering based on:

i. type, extent of fractures, presence of bedding planes, angle of dip,

ii. hydrogeology of surrounding area, and,

iii. cumulative effect of all existing and future systems within the area for any localized mounding or surfacing which may create a public health hazard or nuisance, description of methods used to determine infiltration rate and evaluation of surfacing or mounding conditions.

e. all other requirements of this rule for:

i. installation of absorption systems [~~trenches~~] in sloping ground, and,

ii. minimum horizontal distances in Table 2, except for water course, lake, pond, reservoir, non-culinary spring, foundation drain, curtain drain or grouted well which require a minimum of 50 feet of separation from absorption trench are met.

2. The design shall be based on:

a. a minimum of 300 gallons per day for two bedrooms and [~~150~~]100 gallons per day for each additional bedroom.

b. Intermittent Sand Filter System:

i. Media

(1). Depth - Minimum 24 inches of washed sand

(2). Effective size – 0.3[~~5~~] to 0.5 millimeter

(3). Uniformity Coefficient – 1.0 to 3.0 [~~less than 4.0~~]

(4). Maximum Passing through #200 Sieve – one percent

[~~(5). Voids 30 percent~~]

[~~(6). Surface area 800 1000 square feet per cubic foot~~]

ii. Maximum Application rate – 1.2 gallons per day per square foot of media surface area

iii. Maximum dose volume through any given orifice for each dosing – two gallons [~~Doses per day 18 to 24~~]

[~~iv. Recirculation ratio none~~]

c. Re-circulating Sand Filter System:

i. Media

(1). Depth - Minimum 24 inches of washed sand

(2). Effective size – 1.5 to 2.5 millimeter

(3). Uniformity Coefficient – 1.0 to 3.0 [~~less than 3.0~~]

(4). Maximum Passing through #50 Sieve – one percent
[~~(5). Voids – 30 percent~~]
[~~(6). Surface area – 500 – 700 square feet per cubic foot~~]
ii. Maximum Application rate – 5.0 gallons per day per square foot of media surface area
iii. Maximum dose volume through any given orifice for each dosing – two gallons [~~Doses per day – 48 – 96~~]
[~~iv. Recirculation ratio – 4:1 at peak flow.~~]
d. Re-circulating Gravel Filter System:
i. Media
(1). Depth - Minimum 36 inches of washed gravel
(2). Effective size – 1.5 to 5.0 millimeter
(3). Uniformity Coefficient – 1.0 to 3.0 [~~less than 2.0~~]
(4). Maximum Passing through #16 Sieve – one percent
[~~(5). Voids – 30 percent~~]
[~~(6). Surface area – 500 – 700 square feet per cubic foot~~]
ii. Maximum Application rate – 5.0 gallons per day per square foot of media surface area
iii. Maximum dose volume through any given orifice for each dosing – two gallons [~~Doses per day – 48 – 96~~]
[~~iv. Recirculation ratio – 4:1 @ peak flow.~~]
[~~d. Re-circulating Gravel Filter System:~~
~~i. Media~~
~~(1). Depth – Minimum 36 inches of washed gravel~~
~~(2). Effective size – 1.5 to 5.0 millimeter~~
~~(3). Uniformity Coefficient – less than 2.0~~
~~(4). Maximum Passing through #16 Sieve – one percent~~
~~(5). Voids – 30 percent~~
~~(6). Surface area – 500 – 700 square feet per cubic foot~~
~~ii. Application rate – 5.0 gallons per day per square foot of media~~
~~iii. Doses per day – 48 – 96~~
~~iv. Recirculation ratio – 5:1 @ peak flow.~~]
e. Textile Filter System:
i. Media
(1). Geotextile, AdvanTex or approved equal
[~~(2). Voids – more than 80 percent~~]
[~~(3). Surface area – 2400 – 4800 square feet per cubic foot~~]
ii. Maximum Application rate – 30.0 gallons per day per square foot of media surface area
iii. Maximum dose volume through any given orifice for each dosing – two gallons [~~Doses per day – 72 – 144~~]
[~~iv. Recirculation ratio – 3:1 @ peak flow.~~]
f. Peat Filter:
i. Media
(1). Depth - Minimum 24 inches of peat media
(2). Effective size – 0.25 to 2.0 millimeter
[~~(3). Voids – 90 percent~~]
[~~(4). Surface area – 500,000 square feet per cubic foot~~]

ii. Maximum Application rate – 5 gallons per day per square foot of media surface area

iii. Maximum dose volume through any given orifice for each dosing – two gallons [~~Doses per day – up to 300~~]

[~~iv. Recirculation ratio – none~~]

3. The filter bed must be pressure dosed. Orifices or nozzles shall be of such size that the difference in discharge between the first orifice or nozzle and the last orifice or nozzle in each lateral is less than ten percent. The lateral ends must be equipped with fittings and or enclosures to allow cleaning and servicing from the surface.

4. Recirculation Tank Design:

a. Recirculation tank capacity shall be equal to:

i. at least design flow for one day, or,

ii. other volume supported by the basis of design and operation.

b. design shall include dosing rate, operating, surge and reserve capacities.

c. The recirculation ratio should be adjusted, as necessary during operation and maintenance inspections based on recorded wastewater flow rates; ranging from 3:1 to 7:1.

d. Access to the tanks shall be watertight to the finished grade. [~~Any joint in the riser must be tested during the tank watertight test~~] Any joint where the riser attaches to the tank must be tested during the tank watertightness test by filling a minimum of two inches into the riser.

5. Outlet of septic tanks upstream of packed bed media shall be fitted with effluent filter.

6. Pumping Equipment and Controls:

a. The system shall be equipped with a programmable control panel. The controls shall be capable of controlling all functions incorporated or required in the design of the system. All system control panels must be equipped with an automatic visual and [~~or~~] audible alarm indicating the failure of the pump shall be provided, and shall remain on until turned off manually.

b. The control panel must include a pump run-time hour meter and a pump event counter or other acceptable flow measurement method.

c. The control panel must be installed within sight of the access risers.

d. The control panel must be rated for exterior use. The enclosure must be rated for NEMA 4X or better.

e. The pumps shall be capable of delivering the design flow at the calculated total dynamic head for the proposed system. Supporting hydraulic calculations and pump curve analysis must be submitted to the health department with the design.

f. The pump selected must be rated for the number of cycles anticipated at peak flow conditions.

7. Packed bed system media effluent shall be distributed by gravity or under pressure in an absorption trench designed:

a. in accordance with Table 7 or 13 of this rule for soils percolating between one to 60 minutes per inch.

b. Using the equation:

i. q = 2.1687 x t ^(-0.3806) where t is the percolation rate in minutes per inch, and q is in gallons per day per square foot, for absorption trenches or, q = 1.0414 x t ^(-0.3806) where t is the percolation rate in minutes per inch up to 30 minutes per inch, and q is in gallons per day per square foot, for absorption beds or,

ii. Area in square feet per [~~bed room~~] bedroom = 69.16 x t ^ (0.3806) where t is the percolation rate in minutes per inch for absorption trenches or, area in square feet per bedroom = 144.04 x t ^(-0.3806) where t is the percolation rate in minutes per inch up to 30 minutes per inch, for absorption beds.

c. Dispersal area may be reduced by multiplying the area reduction factor shown in Table 16:

Table 16
Area Reduction Factors

| System | Factor |
|---|---|
| Intermittent Sand Filter | 0.85 |
| Re-circulating Sand Filter | 0.80 |
| Re-circulating Gravel Filter | 0.80 |
| Textile Filters | 0.75 |
| Peat Filters | 0.80 |

[~~d. Effluent distribution may be by gravity or under pressure.~~]

[~~e~~]d. Drip irrigation system may be used for packed bed media system effluent disposal based on type of soil and drip irrigation manufacturer's recommendations, and installed no less than six inches deep in the ground.

[~~f~~]e f. Minimum of two observation ports shall be provided within absorption area.

8. Performance of Packed Bed Media Systems

a. Packed bed media system performance shall be monitored at an interval not exceeding six calendar months for surfacing in absorption trench area, odors around filter systems, equipment malfunction, and effluent quality of a grab sample, taken at a depth of two feet near the outlet of dosing or effluent storage tank or in a manhole before discharge to absorption trench, bed or drip irrigation system, showing no more than 20 nephelometric turbidity units (NTU), or five-day total or carbonaceous biochemical oxygen demand and total suspended solids concentration of no more than 25 milligrams per liter.

b. Effluent turbidity exceeding 20 NTU shall be followed up with two successive weekly testing within a 30-day period from the first exceedance. When two successive effluent testing shows

results in excess of 20 NTU, the system shall be deemed to be non-compliant requiring further evaluation with five-day total or carbonaceous biochemical oxygen demand and total suspended solids concentrations, and a corrective action plan.

c. Corrective action is required where the effluent quality does not meet the minimum standard for more than 30 days.

d. For non-complying systems, the health department shall require and order:

i. all necessary steps such as maintenance servicing, repairs, and/or replacement of system components to correct malfunctioning or non-compliant system;

ii. effluent quality testing for turbidity, five-day total or carbonaceous biochemical oxygen demand, and <u>total</u> suspended solids shall continue every two weeks until three successive samples are found to be in compliance;

iii. payment of fines, fees for additional inspections reviews and testing;

iv. evaluation of the system design including non-approved changes to the system, and the wastewater flow volume, the biological and or chemical loading to the system;

v. investigate the household practices, or discharge of hazardous chemicals into the system, such as, water softener brine, photo finishing chemicals, laboratory chemicals, excessive amount of cleaners or detergents, etc.; and,

vi. additional tests or samples to troubleshoot the system malfunction.

B. Construction Details

i. The site shall be graded such that surface water drains away from the onsite wastewater system and adjoining area.

**R317-4-12. Design, Installation, and Maintenance of Sewage Holding Tanks.**

12.1. Sewage Holding Tanks - Administrative Requirements.

A. Sewage holding tanks are permitted only under the following conditions:

1. Where an absorption system for an existing dwelling has failed and installation of a replacement absorption system is not practicable.

2. As a temporary (not to exceed one year) wastewater system for a new dwelling until a connection is made to an approved sewage collection system.

3. For other essential and unusual situations where both the Division and the local health department having jurisdiction concur that the proposed holding tank will be designed, installed and maintained in a manner which provides long-term protection of the waters of the state. Requests for the use of sewage holding tanks in this instance must receive the written approval of both agencies prior to the installation of such devices.

4. Requests for the use of sewage holding tanks under subparagraphs A and B above must receive the written approval of

the local health department prior to the installation of such devices.

B. Except on those lots recorded and approved for sewage holding tanks prior to May 21, 1984, sewage holding tanks are not permitted for use in new housing subdivisions, or commercial, institutional, and recreational developments except in those instances where these devices are part of a specific watershed protection program acceptable to the Division and the local health department having jurisdiction.

C. The design, installation, and maintenance of all sewage holding tanks, except those for recreational and liquid waste pumper vehicles, must comply with the following:

12.2. General Requirements.

A. No sewage holding tank shall be installed and used unless plans and specifications covering its design and construction have been submitted to and approved by the appropriate regulatory authority.

B. A statement must be submitted by the owner indicating that in the event his sewage holding tank is approved, he will enter into a contract with an acceptable liquid waste pumping company, or make other arrangements meeting the approval of the regulatory authority having jurisdiction, that the tank will be pumped periodically, at regular intervals or as needed, and that the wastewater contents will be disposed of in a manner and at a facility meeting approval of those regulatory authorities.

C. If authorization is necessary for disposal of sewage at certain facilities, evidence of such authorization must be submitted for review.

12.3. Basic Plan Information Required. Plan information for each sewage holding tank, except those in recreational and liquid waste pumper vehicles, shall comply with the following criteria:

A. Location or complete address of dwelling to be served by sewage holding tank and the name, current address, and telephone number of the person who will own the proposed sewage holding tank.

B. A plot or site plan showing:

1. direction of north,
2. number of bedrooms,
3. location and liquid capacity of sewage holding tank,
4. source and location of domestic water supply,
5. location of water service line and building sewer, and
6. location of streams, ditches, watercourses, ponds, etc., near property.

C. Plan detail of sewage holding tank and high sewage level warning device.

D. Relative elevations of:

1. building floor drain,
2. building sewer,
3. invert of inlet for tank,
4. lowest plumbing fixture or drain in building served, and

5. the maximum liquid level of the tank.

E. Statement indicating the present and maximum anticipated ground water table.

F. Liquid waste pumping arrangements for sewage holding tank.

12.4. Construction.

A. The tank shall be constructed of sound and durable material not subject to excessive corrosion and decay and designed to withstand hydrostatic and external loads. All sewage holding tanks shall comply with the manufacturing materials and construction requirements specified for septic tanks.

B. Construction of the tank shall be such as to assure water tightness and to prevent the entrance of rainwater, surface drainage or ground water. All prefabricated or precast sewage holding tanks which are commercially manufactured shall be plainly, legibly, and permanently marked or stamped on the exterior at the inlet end and within six inches of the top of the wall, with the name and address or nationally registered trademark of the manufacturer and the liquid capacity of the tank in gallons.

C. Tanks shall be provided with a maintenance access manhole at the ground surface or above and of at least 18 inches in diameter. Access covers shall have adequate handles and shall be designed and constructed in such a manner that they cannot pass through the access opening, and when closed will be child-proof and prevent entrance of surface water, dirt, or other foreign material, and seal the odorous gases in the tank.

D. A high water warning device shall be installed on each tank to indicate when it is within 75 percent of being full. This device shall be either an audible or a visual alarm. If the latter, it shall be conspicuously mounted. All wiring and mechanical parts of such devices shall be corrosion resistant and all conduit passage ways through the tank top or walls shall be water and vapor tight.

E. No overflow, vent, or other opening shall be provided in the tank other than those described above.

F. The regulatory authority may require that sewage holding tanks be filled with water and allowed to stand overnight to check for leaks. Tanks exhibiting obvious defects or leaks shall not be approved unless such deficiencies are repaired to the satisfaction of the regulatory authority.

G. The slope of the building sewer shall comply with R317-4-6.

12.5. Capacity. Each tank shall be large enough to hold a minimum of seven days sewage flow or 1,000 gallons, whichever is larger. The liquid capacity of the sewage holding tank should be based on sewage flows for the type of dwelling or facility being served (Table 3) and on the desired time period between each pumping. The length of time between pumpings may be increased by careful water management, low volume plumbing fixtures, etc.

12.6. Location. Sewage holding tanks must be located:

A. In an area readily accessible to the pump truck in any type of weather that is likely to occur during the period of use.

B. In accordance with the requirements for septic tanks as specified in Table 2.

C. Where it will not tend to float out of the ground due to a high ground water table or a saturated soil condition, since it will be empty or only partially full most of the time. In areas where the ground water table may be high enough to float the tank out of the ground when empty or partially full, adequate ground anchoring procedures shall be provided.

12.7. Operation and Maintenance.

A. Sewage holding tanks shall be pumped periodically, at regular intervals or as needed, and the wastewater contents shall be disposed of in a manner and at a facility meeting the approval of the appropriate regulatory authority.

B. Sewage holding tanks for seasonal dwellings should be pumped out before each winter season to prevent freezing and possible rupture of the tank.

C. A record of pumping dates, amounts pumped, and ultimate disposal sites should be maintained by the owner and made available to the appropriate regulatory authorities upon request.

D. Sewage holding tanks shall be checked at frequent intervals by the owner or occupant and if leakage is detected it shall be immediately reported to the local health authority. Repairs or replacements shall be conducted under the direction of the local health authority. Major increases in the time of pumpings without significant changes in water usage could indicate leakage of the tanks.

E. Improper location, construction, operation, or maintenance of a particular holding tank may result in appropriate legal action against the owner by the regulatory authority having jurisdiction.

**R317-4-13. Recommendations for the Maintenance of Septic Tanks and Absorption Systems.**

13.1. Recommendations for the Maintenance of Septic Tanks and Absorption Systems.

A. Septic tanks must be cleaned before too much sludge or scum is allowed to accumulate and seriously reduce the tank volume settling depth. If either the settled solids or floating scum layer accumulate too close to the bottom of the outlet baffle or bottom of the sanitary tee pipe in the tank, solid particles will overflow into the absorption system and eventually clog the soil and ruin its absorption capacity. Illustrations of typical absorption system components such as septic tanks, distribution boxes, and absorption systems are contained in an addendum to these rules, available through the Division of Water Quality

B. A septic tank which receives normal loading should be inspected at yearly intervals to determine if it needs emptying.

Although there are wide differences in the rate that sludge and scum accumulate in tanks, a septic tank for a private residence will generally require cleaning every three to five years. Actual measurement of scum and sludge accumulation is the only sure way to determine when a tank needs to be cleaned. Experience for a particular system may indicate the desirability of longer or shorter intervals between inspections. Scum and sludge accumulations can be measured as follows:

1. Scum can be measured with a long stick to which a weighted flap has been hinged, or any device that can be used to determine the bottom of the scum mat. The stick is forced through the mat, the hinged flap falls into a horizontal position, and the stick is lifted until resistance from the bottom of the scum is felt. With the same tool, the distance to the bottom of the outlet device (baffle or tee) can be found.

2. Sludge can be measured with a long stick wrapped with rough, white toweling and lowered into the bottom of the tank. The stick should be small enough in diameter so it can be lowered through the outlet device (baffle or tee) to avoid scum particles. After several minutes, if the stick is carefully removed, the height to which the solids (sludge) have built up can be distinguished by black particles clinging to the toweling.

C. The tank should be pumped out if either the bottom of the floating scum mat is within three inches of the bottom of the outlet device (baffle or tee) or the sludge level has built up to approximately 12 inches from the bottom of the outlet device (baffle or tee). Little long-term benefit is derived by pumping out only the liquid waste in septic tanks. All three wastewater components, scum, sludge, and liquid waste should be removed. Tanks should not be washed or disinfected after pumping. A small amount of sludge should be left in the tank for seeding purposes.

D. If multiple tanks or tanks with multiple compartments are provided, care should be taken to insure that each tank or compartment is inspected and cleaned. Hollow-lined seepage pits may require cleaning on some occasions.

E. Professional septic tank cleaners, with tank trucks and pumping equipment, are located in most large communities and can be hired to perform cleaning service. In any case, the septic tank wastes contain disease causing organisms and must be disposed of only in areas and in a manner that is acceptable to local health authorities and consistent with State rules.

F. The digestion of sewage solids gives off explosive, asphyxiating gases. Therefore, extreme caution should be observed if entering a tank for cleaning, inspection, or maintenance. Forced ventilation or oxygen masks and a safety harness should be used.

G. Immediate replacement of broken-off inlet or outlet fittings in the septic tank is essential for effective operation of the system. On occasion, paper and solids become compacted in the vertical leg of an inlet sanitary tee. Corrective measures

include providing a nonplugging sanitary tee of wide sweep design or a baffle.

H. Following septic tank cleaning, the interior surfaces of the tank should be inspected for leaks or cracks using a strong light. Distribution boxes, if provided, should be inspected and cleaned when the septic tank is cleaned.

I. A written record of all cleaning and maintenance to the septic tank and absorption system should be kept by the owner of that system.

J. The functional operation of septic tanks is not improved by the addition of yeasts, disinfectants or other chemicals; therefore, use of these materials is not recommended.

K. Waste brine from household water softening units, soaps, detergents, bleaches, drain cleaners, and other similar materials, as normally used in a home or small commercial establishment, will have no appreciable adverse effect on the system. If the septic tank is adequately sized as herein required, the dilution factor available will be sufficient to overcome any harmful effects that might otherwise occur. The advice of your local health department and other responsible officials should be sought before chemicals arising from a hobby or home industry are discharged into a septic tank system.

L. Economy in the use of water helps prevent overloading of a septic tank system that could shorten its life and necessitate expensive repairs. The plumbing fixtures in the building should be checked regularly to repair any leaks which can add substantial amounts of water to the system. Industrial wastes, and other liquids that may adversely affect the operation of the onsite wastewater disposal system should not be discharged into such a system. Paper towels, facial tissue, newspaper, wrapping paper, disposable diapers, sanitary napkins, coffee grounds, rags, sticks, and similar materials should also be excluded from the septic tank since they do not readily decompose and can lead to clogging of both the plumbing and the absorption system.

M. Crushed, broken, or plugged distribution pipes should be replaced immediately.

**KEY: waste water, onsite wastewater systems, alternative onsite wastewater systems, septic tanks**
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